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J. H. Browning

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With the assistance of

FREDERICK BOND, F.Z.S.	FREDERICK SMITH, F.Z.S.
EDWARD A. FITCH.	J. JENNER WEIR, F.L.S., F.Z.S.
JOHN A. POWER, M.D.	F. BUCHANAN WHITE, M.D., F.L.S.

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Lagria hirta, *L.*
Otiorynchus scabrosus, *Marsh.*
,, ligneus, *Ol.*
,, picipes, *F.*
,, sulcatus, *F.*
Trachyphlœus scaber, *L.*
,, sqamulatus, *Ol.*
Liophlœus nubilus, *F.*
Barynotus obscurus, *F.*
Strophosomus coryli, *F.*
,, retusus, *Marsh.*
Sitones flavescens, *Marsh.*
,, sulcifrons, *Thum.*
,, tibialis, *Herbst.*
,, Waterhousei, *Walt.*
,, cinerascens, *F.*
,, regensteinensis, *Hbst.*
,, puncticollis, *Steph.*
,, lineatus, *L.*
,, hispidulus, *F.*
Polydrosus pterygomalis, *Sch.*
Sciaphilus muricatus, *F.*

Liosomus ovatulus, *Clair.*
Hypera nigrirostris, *F.*
,, variabilis, *Herbst.*
Hylobius abietis, *L.*
Mecinus pyraster, *Hbst.*
Anthonomus rubi, *Hbst.*
,, comari, *Crotch.*
Orchestes quercus, *L.*
,, alni, *L.*
,, fagi, *L.*
Rhamphus flavicornis, *Clair.*
Tychius picirostris, *F.*
Nanophyes Lythri, *F.*
Ceuthorynchus assimilis, *Pk.*
,, erysimi, *F.*
,, constrictus, *Msh.*
,, ericæ, *Gyll.*
,, litura, *F.*
,, quadridens, *Pz.*
,, sulcicollis, *Gyll.*
Ceuthorynchideus troglodytes, *F.*
Phytobius 4-tuberculatus, *F.* (D.)
Rhinoncus pericarpius, *F.*
Apion subulatum, *Kirb.*
,, carduorum, *Kirb.*
,, striatum, *Kirb.*
,, seniculum, *Kirb.*
,, viciæ, *Pk.*
,, fagi, *L.*
,, flavipes, *F.*
,, virens, *Hbst.*
,, Gyllenhalli, *Kirb.*
,, ervi, *Kirb.*
,, pisi, *F.*
,, æthiops, *Hbst.*
,, loti, *Kirb.*
,, vorax, *Hbst.*
,, miniatum, *Germ.*
,, cruentatum, *Walt.*
,, frumentarium, *L.*
,, violaceum, *Kirb.*
Bruchus seminarius, *L.*
,, ater, *Marsh.*
Pogonocherus pilosus, *F.* (D.)
Lema cyanella, *F.*
,, Erichsoni, *Suf.*
Lamprosoma concolor, *Strm.* (D.)
Chrysomela Banksi, *F.* (D.)
,, staphylæa, *L.*
Chrysomela polita, *L.*
Phædon tumidulum, *Kirb.*
Adimonia sanguinea, *F.*
Galeruca lineola, *F.*
Haltica longicollis, *All.*
,, ericeti, *All.*
,, pusilla, *Duft.*
Crepidodera transversa, *Marsh.*
,, ferruginea, *Scop.*
,, ventralis, *Ill.*
Apthona hilaris, *Steph.*
Phyllotreta lepidii, *E. H.*
,, atra, *Pk.*
,, undulata, *Kuts.*
,, nemorum, *L.*
,, sinuata, *Steph.*
Plectroscelis concinna, *Marsh.*
,, aridella, *Pk.*
Thyamis parvula, *Pk.*
,, holsatica, *L.*
,, brunnea, *Duft.*
,, lurida, *Scop.*
,, atricilla, *Gyll.*
,, melanocephalus, *Gyll.*
,, pusilla, *Gyll.*
,, tabida, *Pz.*
,, gracilis, *Kuts.*
,, lævis, *Luft.*
Psylliodes dulcamaræ, *E. H.*
,, chrysocephala, *F.*
,, *var.* nigricollis, *Marsh.*
,, cupronitens, *Forst.*
,, attenuata, *E. H.*
,, affinis, *Pk.*
Sphæroderma testacea, *F.*
,, cardui, *Gyll.*
Cassida viridis, *L.*
,, obsoleta, *Ill.*
Coccinella 7-punctata, *L.*
,, hieroglyphica, *L.*
,, variabilis, *Ill.*
,, ocellata, *L.*
,, 14-guttata, *L.*
,, 14-punctata, *L.*
,, 22-punctata, *L.*
Scymnus Mulsanti, *Wat.*
,, limbatus, *Steph.*
Rhizobius litura, *F.*

IRISH HEMIPTERA.

Pentatoma baccarum, *L.*
„ viridissima, *Pod.*
Rhacognathus punctatus, *L.*
Picromerus bidens, *L.* (D.)
Tropidocoris rufipes, *L.* (D.)
Piestodorus lituratus, *F.*
Drymus sylvaticus, *F.*
Stygnocoris rusticus, *Fall.*
„ sabulosus, *Schill.*
„ arenarius, *Hahn.*
Nysius thymi, *Wolff.* (D.)
Monanthia cardui, *L.*
Orthostira cervina, *Germ.*
„ obscura, *Schæff.*
Miris holsatus, *F.*
„ lævigatus, *L.*
„ calcaratus, *Fall.*
„ ruficornis, *Fall.*
Phytocoris dimidiatus, *D. & S.*
„ floralis, *F.*
„ ulmi, *L.*
Dereocoris bipunctatus, *Scop.*
„ sexguttatus, *F.* (D.)
„ binotatus, *F.*
Litosoma viridinervis, *Kirsch.*
„ concolor, *Kirsch.*
Aëtorhinus angulatus, *Fall.*
Sphyrops ambulans, *Fall.*
Byrsoptera rufifrons, *Fall.* (D.)
Globiceps flavomaculatus, *F.*
Campyloneura virgula, *Schæff.*
Tinicephalus obsoletus, *D. & S.*
Plagiognathus viridulus, *Fall.*
„ arbustorum, *F.*
Psallus salicellus, *Mey.*
„ lepidus, *Fieb.*
Orthocephalus saltator, *Hahn.*
Heterocordylus tibialis, *Hn.* (D.)
Heterotoma merioptera, *Scop.*
Rhopalotomus ater, *L.* (D.)
Capsus capillaris, *F.* (D.)
Charagochilus Gyllenhalli, *Fal.*
Liocoris tripustulatus, *Fall.* (D.)
Orthops Kalmi, *L.*
„ cervinus, *Schæff.*
„ pastinacæ, *Fall.*
Lygus pabulinus, *L.*
„ campestris, *L.*
Zygonotus elegantulus, *Ban.*
Tetraphleps vittatus, *Fieb.*
Temnostethus pusillus, *Schæff.*
Anthocoris nemorum, *L.*
„ nemoralis, *F.*
Lyctocoris campestris, *F.*
Salda saltatoria, *L.*
„ scotica, *Curt.* (D.)
Plœaria vagabunda, *L.*
Nabis apterus, *F.*
„ limbatus, *Dahlb.*
„ flavomarginatus, *Scholtz.*
„ ericetorum, *Scholtz.*
Corixa nigrolineata, *Fieb.*

52, Burton Crescent, November 13, 1877.

ENTOMOLOGICAL RAMBLES, 1877.

By J. B. HODGKINSON.

I PURPOSE briefly to note captures and journeys made to various districts, and will begin with my first visit to Witherslack, about the middle of March, expecting to find *Butalis incongruella*, and a lot of other hibernated species. Although the weather was tolerably fine there was little or no sunshine; and the only insect that ventured to fly was one *Gracilaria phasianipennella*, the only one I saw this season.

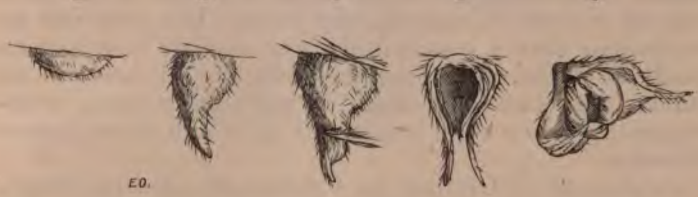
My friend Mr. Threlfall was with me, and he only met with one. We were evidently too early for all the *Micropteryx*, so turned to finding *Elachista* larvæ, but with little success. During the whole of the month of April there was little or no sun, so there was an entire void of all the species I had met with in former years. May came in, and now some of the early April species appeared, such as *Lobophora polycommata*, very fine, on May 12th, at Witherslack; the usual time is April 12th. The hibernating *Depressariæ* began to creep out in the middle of May, and two *Capreolella* crept up whilst I was boxing *Elachista subnigrella;* and at Witherslack *Micropteryx salopiella* only began to appear about May 20th, as well as *Incurvaria Zinckenella*. I was afraid that as all the birches that *M. salopiella* was on had been cleared away during the winter I should find none of that species; but there were some little bushes sheltered from the wind, which never ceased to blow; and as I stood beside them patiently, they came popping up as if by magic during the gleams of sunshine, so I netted over thirty specimens. Whilst standing motionless I heard something hissing for some time, but was too intent on *M. salopiella* to pay attention to the cause. At last the reptile, probably tired of my presence, began to crawl off, when I despatched it with my stick. I then went round the bush, and there was another fine viper, which was really a pretty sight: the fore part of the body was raised in a straight line, about two inches off the ground, with its eyes looking at me to see if I was going to pass on; it was motionless to escape detection, and the peculiar position made it look more like a piece of lichen-coloured fir-stick than a snake; however the same fate befel it as the other. The weather was bitterly cold for larva hunting. *Sciaphila Penziana*, *Crambus geniculellus*, and a good many *Satyrus Semele* larvæ turned up among the roots of the grass on the rocks; off the birch came fine larvæ of the butterfly emerald (*Geometra papilionaria*), but they stick hard and fast. On the heath we swept some hundreds of cases of *Coleophora pyrrhulipennella*, not one in a dozen of which, however, may be expected to breed up. *Catoptria aspidiscana*, like other things, was not as common as usual, but it was hard to judge; some odd corners seemed to yield well. All the butterflies, *Nemeobius Lucina*, *Lycæna Argiolus*, *Thanaos Tages*, &c., were very scarce; *Leucophasia Sinapis* I saw laying its eggs, as usual, on the *Lotus corniculatus*, in the woods at Grange. Sticking on the rocks, at Witherslack, we found scores of cases of

Solenobia triquetrella: not a single male came out; nothing but apterous females. On the heaths scarcely a living insect; even the hawking *Diptera*, *Empis borealis*, was either like what it likes to kill—*nil*, or it was not worth turning out to look for food; and the species was fully a month late in appearing. There were no emeralds, and only very few *Geometra* larvæ; *A. strigillaria* was the chief one. May passed away without much being done. I had been to Windermere during the month several times, and there was little or nothing to be seen; the only insects I got on May 28th were *M. salopiella*, *I. Zinckenella*, and one *I. tenuicornella.* This is a new locality for these species; and the place where I took them is in a wood close to Windermere Station. I may note now for June, whilst I am on this locality, that *Micropteryx Mansuetella* was very scarce. The only species tolerably common was *M. Allionella* among the honeysuckle, and *Capua ochraceana* was pretty plentiful; but it was really dejecting to see no life around. Scarcely a wood wren to utter its plaintive and tremulous note. As to beating, a chip-axe (*Eurymene dolobraria*) tumbled down like a dead leaf; and an odd *Cidaria corylata*, and now and then an *Argynnis Euphrosyne* was to be seen; so off I set to look for the field where Allis and I used to take *Coleophora deauratella.* Here another blank: the nice stream that ran through the fields had been drained off, and it was now a potato field; another locality gone. Now into the woods again for larvæ of *Argyresthia Andereggiella:* they, like other things, were a poor crop, and still worse to breed. Two or three more visits yielded little worth note; only *Tinagma resplendella*, *Eupithecia plumbeolata* among the *Melampyrum*, and on the birch I took *Coleophora Wilkinsonella* and *Cryptoblabes bistrigella*, and an odd specimen each of *Phoxopteryx diminutana* and *Stigmonota puncticostana.* I must close June, so far as Windermere is concerned, and go back to another region.

Early in June Mr. Threlfall and I paid a visit to Heysham, below Morecombe, to look for larvæ; but the wind blew a gale, and on the high exposed cliffs we had to lie down to shelter the plants we were examining, and then the cold was miserable. On *Genista tinctoria* we got a lot of larvæ of *Anarsia genistella:* from specimens bred we conclude they are identical with *A. spartiella;* they are darker than *A. spartiella*, which we attribute to the plant being more succulent than the common broom. The *Depressaria* *costosella* larvæ on the same plant produced much handsomer moths than those of the common whin or furze. Our next try was to find the larva of *Spilonota amœnana* (*incarnatana*) on the *Rosa spinosissima:* we saw our old friend *Dictyopteryx Bergmanniana*, which we recognised, and made out that we had three species of *Tortrix* larvæ; the other two species produced one only of *S. amœnana*, and several *S. roborana.* Our elbows being sore with lying on them, and our eyes full of sand, and being starved into the bargain (this in June), in order to stretch ourselves we went among the rocks to birds'-nest: rock pipits and rock doves were there; but this game was soon up, when we saw great patches of *Cochlearia* hanging down in masses, and I told my energetic friend this was the spot where I took some years ago the handsome Irish form of *Plutella annulatella*. He was not long before he was up and throwing the plant down to me; but some of the loose soft freestone giving way gave him a hint to be cautious. We filled our bags and nets, too, with the plant. In the meantime I tumbled one-half of mine away, expecting to find the larva of *Gelechia leucomelanella* to fill its place; but no such luck; it would have been better to leave the plant on the chance of *P. annulatella.* But here is another mystery: I beat over and over again the plants I had thrown out on to a bare rock, and not a larva could be seen, nor yet any traces of the seed being eaten. However, I tumbled the remaining plants on to a newspaper in my breeding-room; and next day there were several fine full-fed larvæ. They changed well on the paper, and I bred over a score. The larvæ must have been buried over head in the seed-pods. This was the only journey to Morecombe.

Now we will pay a visit to Humphrey Head, a bold promontory right opposite, about eleven miles across. During the last week in June, the wind blowing as usual, we kept waiting for fine weather, which never came. We had a resolve always ready that we would go in spite of wind or weather. At last it was dry for a few days, so off we set to look for *Coleophora salinella* on a salt marsh, where I took such a lot some years ago. We had to crawl on our hands and knees, parting the grass to get as many as we did, *viz.* about thirty each: this was two days' work. On the Saturday night we went on the rocks, hoping to take *Barrettii;* but no such luck: we were starved off, and only got *Eupithecia constrictata*, *Ligdia adustata*, *Sericoris littorana*, and such like,—a miserable catch for the misery in store for us. We

About the 30th of October, 1877, when these galls were exceedingly plentiful by one of the streams in the neighbourhood of Isleworth, my attention was attracted by the great variety of shape on the part of the gall-growths beneath the leaves, some (apparently still in their earliest stages) being simply like a white blister, or semi-globose protuberance, beset with white silky hairs (fig. 1); others globose and prolonged to a funnel-shaped extremity (fig. 2); whilst other fully-grown specimens had the funnel-shaped extremity broader and more developed, or open for the exit of the gall-gnat larva.

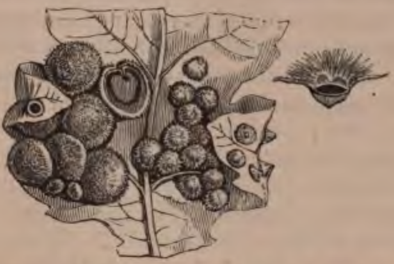


Development of galls showing—1. First stage. 2. Further development, with funnel-shaped extremity. 3. Fully developed gall. 4. The same, in section. 5. Gall spread open after exit of the larva.

On carefully examining the gall in its first stage by pressing the side of a fine needle across the convex top, it would be found there was a narrow strap-like process (the future funnel-shaped extremity) folded flatly down on it, in the same way as the tip of a glove can be laid on the contained finger. As growth proceeded this folded extremity altered its position to the complete funnel-shape given at fig. 2, the long blunt point being divided into two parts by a slit on each side, running about a third of the length of the gall and gradually widening, till at the time for the evolution of the larva the outer husk of the gall was merely a globose case, tubular below, of two somewhat leaf-like portions of filmy tissue, closely applied by their edges and guarding the true gall, much as the young filbert is guarded in the long projecting husk, and varying from the portion exposed on the upper side of the leaf in being usually white, and thickly beset with white hairs.

The inner or true gall is similarly globose, and somewhat pointed, usually single-celled, of thin tissue, more succulent towards its base, and white; flocculent outside, but of perfect

1 millimetre in height, and with a horizontal diameter of about 2 millimetres at the base; it is bare and green, but later on it becomes yellow or yellowish brown. At the corresponding spot on the under side of the leaf it appears as a circular, slightly convex, projecting disk, of about 2 millimetres in diameter: it is very thickly covered with yellow or yellowish brown outstanding, fine, but tolerably long, hairs. In the interior is a larva-chamber, in which the reddish orange maggot lies. When the gall contains the gall-gnat larva, and not a parasite, towards the end of October or beginning of November the fully ripe gall swells, so that this disk opens like the lid of a box, and the maggot falls to the ground, where it winters and changes to a pupa, till in May the perfect gall-gnat is evolved. Should the gall contain the larva of an ichneumon the lid does not open; and in order to release itself the fly bites a round hole through the side of the cone on the upper side of the leaf.—G. L. MAYR.



Figs. 77 & 78.—Galls of *Cecidomyia cerris*, and in section; Galls of *Cecidomyia circinans*, and a specimen in horizontal section.

78. *Cecidomyia circinans*, Gir.—This gall may be found on the under side (rarely on the upper side) of the leaf of *Quercus cerris*, often mixed with the preceding species on the same leaf. It occurs as a circular or kidney-shaped disk, which is about 2 millimetres high, with a horizontal diameter of 5 to 6 millimetres, and is thickly covered with outstanding, yellow or gray, hairs. In the centre of the gall, on the upper side of the leaf, it exhibits an annular, mostly yellow, swelling, with an extreme diameter of from 2 to 2·5 millimetres; within this is a thin, hairy membrane, stretched horizontally, which, when the gall becomes mature, opens in the middle and forms a cavity: this leads to the interior at the axis of the gall, and curving spirally becomes formed into a circular channel, which terminates near the periphery of the orbicular

gall, and contains the maggot. This gall appears at the same time as the preceding, yet the maggot passes the winter in the gall, and leaves it as a fly in April: it leaves the annular swelling on the upper side of the leaf in such a manner that half or more of the white pupa-case is left protruding from the ring. Besides these two cecidomyideous galls I have found several rarer ones on the leaves of the Turkey oak, which are similar in appearance, and probably are also produced by gall-gnats; but I have not as yet obtained the gall-maker.—G. L. Mayr.

Two other species of *Cecidomyidæ* are known to make galls on *Quercus cerris.* They are both inhabitants of Austria, but the imagos are undescribed. The gall of *Cec.? subulifex*, Mayr, is mentioned by Giraud (V. z. b. G., 1861), Frauenfeld (1870), Mayr (1874), and F. Löw (1874). That of *Cec.? galeata*, Ffld., only by Frauenfeld (V. z. b. G., 1861). All four species, being confined to the Turkey oak, are not likely to occur in Britain. At the 4th October, 1876, meeting of the Vienna Society, Dr. Franz Löw read a paper on gall-gnats, in which he described *Cecidomyia homocera*, n. sp., from leaf-galls of *Quercus cerris.* This paper is not yet printed, so I do not know whether it refers to one of the above mentioned or is a fifth species. Remarks on the parasitism, which is curious, may be deferred, as I hope soon to obtain fresh specimens of the galls. Dr. Mayr has obtained two species of *Cynipidæ* and two species of *Torymidæ* from them.—E. A. Fitch.

NOTES ON NEW AND RARE HYMENOPTERA, CAPTURED DURING THE YEAR 1877.

By Frederick Smith.

The past season—as far as my own observation has enabled me to ascertain, and from information derived from others—must be pronounced to have been most unfavourable for the collection of the *Aculeata.* According to my experience of such seasons, they are those in which a few great rarities, or the appearance of particular species in very unusual abundance, may be expected to occur; and the past has been no exception to what is apparently a rule. Some years ago I spent the month of August at Deal; during the entire month scarcely a day passed without rain, and the few days that were free from showers were cold and windy.

The day before leaving one of the best localities for collecting *Aculeata* a fine autumnal day occurred, just the day an entomologist longs for. On that day I took twenty-two specimens of *Andrena Hattorfiana*, the finest species of the genus found in this country. This year I visited the same locality, at the same date in August, where on a splendid day not only did I fail to find *A. Hattorfiana*, but I also failed in finding a single specimen of any species of the genus *Andrena*. My favourite bank, at Kingsdown, was, on that occasion, the resort of hundreds of *Colias Edusa*.

In recording what has come to my knowledge of notable captures, I must mention a new species of ant, *Ponera tarda*, discovered by Mr. R. S. Charsley, in a conservatory, at Oxford; he has subsequently described the species. The rare bee, *Prosopis dilatata*, was taken at Hayling Island, by Mr. Edward Saunders. Some very interesting varieties of species of the genus *Sphecodes* have been met with at Guestling, near Hastings, by the Rev. E. N. Bloomfield: a totally black variety of *S. gibbus* (male), and three similar varieties of *S. ephippius* (male). These are the first I have seen of this small bee. Of *S. gibbus* I took four black males on one occasion, at Lowestoft, some years ago; but the black varieties are of very rare occurrence. At the beginning of July I found the very local *Colletes marginata* at Littlehampton; the somewhat local bee, *Megachile maritima*, was plentiful at the same locality, as well as *M. argentata*.

Of the genus *Halictus* Mr. Edward Saunders has taken two or three apparently new species, belonging to the same division as *H. minutus;* also the *H. pauxillus* of Schenck. Mr. Saunders has also taken a fine series of *Andrena nigriceps*, at Southwold, in the month of August. *Andrena spinigera* has been captured at Guestling, near Hastings, by the Rev. E. N. Bloomfield; but the great discovery, made by the same gentleman, of a genus and species new to Britain, is the capture of the season: the bee is *Rophites quinquespinosus*, a species widely distributed on the Continent. I possess examples from the South of France, Nassau, and the Island of Malta. Only a single female was taken at Guestling, and was no doubt mistaken for a species of the genus *Halictus*, to which it undoubtedly bears a strong resemblance; but *Rophites* has an elongate tongue, only two submarginal cells, and has not the anal rima which distinguishes the females of *Halictus;* the male has the anterior of each segment which is characteristic of so many of the species in the genus *Acidalia*. Skin tolerably smooth, but with a tough appearance. The ground colour of the dorsal surface is stone-gray, with very faint pink tinge on the front and posterior segments. Head dirty, smoky brown, with pale stone-coloured streak on each lobe. The medio-dorsal line is pale gray, but very narrow and indistinct; on the 10th to 13th segments it is very broadly edged with smoke-colour; on the other segments this smoke-colour takes the form of a very pretty, but almost indescribable, pattern, having the appearance of a double series of **V**-shaped marks, or rather a **V** mark and an **X** mark, the posterior half of the **X**, however, being much narrower than the anterior, the **V** mark being within the anterior of the **X** mark. There are no other distinct markings, but the sides are much marbled with the dark smoke-colour. The ventral surface seems to have an under-ground of pinkish gray, but is very strongly suffused throughout with pale blue; the sides are thickly dotted and marked with smoky black. Extending the whole length is a series of large pear-shaped marks, one on each segment, and the narrow end of the pear-mark pointing towards the head: these marks are of two colours, a broad central stripe being pale blue, the remainder pinkish, and on the marks is a conspicuous series of black **Y**-shaped marks; spiracles imperceptible. When at rest the food-plant is grasped by the claspers, and the anterior segments coiled inwards, the head and legs being tucked closely together. The cocoons were formed of a few threads drawn loosely together in the corners of their cage, or amongst withered leaves at the bottom. The pupa is about three-eighths of an inch long, has the thorax rounded, the eyes prominent, and the abdomen tapering sharply to a point. Ground colour dark ochreous-yellow, and the back of each segment neatly marked with four transverse dark brown spots; eye- and wing-cases dull dark green; tip of abdomen very dark brown. A beautiful and strongly-marked series (some almost black) of imagos emerged at the end of June, or in July.—GEO. T. PORRITT; Highroyd House, Huddersfield, December 6, 1877.

LATE APPEARANCE OF PYRAMEIS CARDUI.—On the 24th of September last I found a solitary larva of *Pyrameis cardui* feeding on thistle. It fed up slowly, turned to a pupa on the 8th of October, and the butterfly emerged on the 24th of November.—ROSA M. SOTHEBY; Sunnyside, Hastings, Sussex.

A. pistacina, which retains the usual markings, but each fore wing is ornamented with a large blotch of a metallic cast near the hind margin, and reaching from the costal to the inner margin. Can anyone account for such a variety; and is it usual?—F. STEWART; New Cross.

CAPTURES NEAR UXBRIDGE.—Among my captures lately have been specimens of the following insects:—*Sphinx convolvuli*, *Nola strigula*, *Liparis dispar*, *Ennomos fuscantaria*, *E. erosaria*, *Selene illustraria*, *Boarmia consortaria*, *Phorodesma bajularia*, *Sterrha sacraria*, *Apamea fibrosa*, *Xanthia aurago*, *Cirrhœdia xerampelina*, &c.

CAPTURES NEAR WINCHESTER.—*Epione advenaria*, *Emmelesia unifasciata*, *Notodonta trepida*, *Apamea ophiogramma*, *Agrotis cinerea*, &c.

CAPTURES NEAR BRIGHTON.—*Sphinx convolvuli*, *Acidalia rusticata*, *Eremobia ochroleuca*, &c.

CAPTURES NEAR EXETER, &c.—*Larentia cæsiata* (on Yes Tor, Dartmoor. Is not this unusual in the South?), *Phibalapteryx polygrammata*, *Tethea retusa*, &c.

I believe these are new localities for *S. sacraria*, *C. xerampelina*, *A. fibrosa*, *A. ophiogramma*, *A. rusticata*, *P. polygrammata*, and *L. cæsiata*.—J. E. BENBOW; Grosvenor House, Hillingdon, near Uxbridge, October 24, 1877.

FEMALE MOTHS ATTRACTING MALES.—Attention having been invited to this subject in a past number of the 'Entomologist,' I venture to record a fact which is new to me, and perhaps to others, that *Sphinx ligustri* possesses this power in no small degree. A crippled female having emerged early last June, I placed her upon the curtain in my bedroom: though the window was open all day no males entered before I went to bed at half-past eleven p.m.; but about three o'clock I was aroused by a loud knocking at the window, which is forty feet from the ground. Leaping out of bed I struck a light, and captured no less than ten males in the room, and could see two others on the glass outside. At this time the female was dead, for I had accidentally crushed her between the bars of the Venetian blind early in the evening. Probably the females of other *Sphingidæ* will prove as attractive during the small hours of the morning. I have also known the female of *Bombyx quercus* after death to attract several males. *Pseudopterpna cytisaria* assembles males from about seven to nine p.m.; indeed I have found that it is a good plan to watch the males as they fly among the furze bushes in order to obtain newly-emerged females;

but as they always seem to be in the centre of a thick furze bush the capture necessitates no small amount of agony. *Amphydasis betularia* and *Chelonia villica* also attract males in the dusk of the evening. I have also several times discovered the females of *Hepialus hectus and H. sylvinus* by making a diligent search in spots where the males were hovering.—E. K. Robinson; St. Leonard's, Oct. 19, 1877.

Macropis labiata, *Panz.*—I am indebted to the Rev. J. L. Brown for the first specimen of this insect captured in Norfolk. He industriously collected insects of all orders to make microscopic preparations, and before putting them into spirit very kindly let me look them over and take what I wanted; and it was amongst one of these gatherings I found my first male *Macropis labiata*, taken on the 8th or 10th July, 1874, but where he could not remember, whether at Brundall or Swainsthorpe. I could not find it that year; but next, 1875, I took one male on the creeping thistle at the former locality. In 1876 I took seven more males at the same flower. This present year (1877) I took the first on the 15th of July, and they were to be seen till the middle of August; this year I took the males, not only at the above-mentioned plant, but also at the *Lysimachia*, mint and marsh *Potentilla*. On the 5th of August I took the first British female at the creeping thistle, and on the 14th I took ten more; most of these were more or less imperfect; of these latter two were on the creeping thistle, but not one of these three had any pollen; the others were all at the *Lysimachia*, and had their legs well covered with the pollen, and had evidently drawn their supply from that flower. The insect is a very swift flyer, but not at all active when on the flowers. The locality where they are found is by the side of a boggy marsh, but has much higher ground by the side of it: I am inclined to believe they burrow into a dry-ditch bank. I am greatly indebted to Mr. F. Smith for advice as to where to look for the missing female. Should any hymenopterists have a vacant place in their collection, I have a few duplicates left, which I shall be happy to distribute as far as they will go.—John B. Bridgman; Norwich.

Coleoptera-hunting in 1877.—During the past year my *Coleoptera*-hunting has been very successful, although I have not devoted very much time to it. In the early part of June, in beating the blossoms of the hawthorn, I took a specimen of *Orsodacna nigriceps*, about a mile from Oxford, and although I sought diligently I did not see another example. In

November (I forget the exact date) I took, in an old sand martin's nest on the side of Shotover Hill, near Oxford, a single specimen of the curious and very rare little *Leptinus testaceus*, a remarkable locality, I believe, for the insect. Both of these specimens Professor Westwood kindly assisted me to identify. I took also single specimens of *Rhagium bifasciatum* (dead, and much injured) and *Ochina hederæ*, at Bishopstone, near Hereford; *Cillenum laterale*, under a stone, at Aber, and *Cryptolithus riparius* on the top of Moel Union, in North Wales. I found a number of the larvæ, imagos, and one pupa, of *Melanotus castanipes*, in a decaying fir tree, at Bishopstone, in September.—HENRY N. RIDLEY; 46, Holywell, Oxford, December 13, 1877.

MOULD ON INSECTS.—In Greene's invaluable 'Insect Hunter's Companion,' on the subject of mould, I find the following:—"Every insect ought to be touched with a weak solution of bichloride of mercury in alcohol. . . . I believe insects never get mouldy when this is done." But supposing insects, as mine, *have not* been touched, and *have* got mouldy, will this cure them? If not, what will? I should be very much obliged for any information which would help me to get rid of "this, the worst enemy the collector has to deal with."—G. R. DAWSON; Poundsworth, Driffield, December 3, 1877.

[The best preventative known against mould on cabinet specimens of insects is glacial carbolic acid. This may be obtained in small bottles from any chemist. The readiest way of applying it is to place the bottle, having first removed the stopper, in a cup of hot water, which thaws the frozen acid. Then have a little piece of cotton-wool, about the size of a pea, placed on the head of a small pin: this must be soaked in the warm fluid acid. As soon as exposed to the air, in ordinary temperature, the acid on the wool hardens, and then the pin may be stuck in the cabinet drawer: two of these pieces of cotton-wool, so soaked, in each drawer, will deter any further spread of the microscopic fungus, called mould. All specimens already attacked with this fungus may be cleaned with the preparation of alcohol above mentioned. But the greatest preventative of all is to keep the cabinet or store-boxes in a dry room. We may also note that, in answer to an enquiry, Mr. G. R. Crotch gave the following method in the third volume of the 'Entomologist,' p. 72:—"The best way of removing mould from the wings is to dry the insect thoroughly before the fire, and brush it off with a camel's-hair brush. From the antennæ it can be removed by the above application (one part of carbolic acid to ten of benzine), which might with advantage be applied to the under surface of the body. A slightly stronger solution, brushed over the corners of the drawer and the glass frames, would probably check any further development of mould, as also of mites." The enquirer, Mr. F. Wilkinson, tried this plan, and found it successful.—Ed.]

Haggerston Entomological Society.—The Annual Exhibition of this Society was held at their rooms, 10, Brownlow Street, Dalston, on the evenings of Thursday and Friday, 8th and 9th November. The walls were tastefully decorated with preserved fish, birds, &c. The principal exhibitions were as follows:—Mr. C. A. Briggs exhibited a fine variety of *Satyrus Janira*, taken at Folkestone. Mr. Eedle, *Heliothis armigera*, a dark brown variety; *H. peltigera*, very light; *Camptogramma fluviata*, *Anticlea sinuata*, and a case containing preserved larvæ, including *Stauropus fagi*. Mr. Cooke, some fine exotic *Lepidoptera*. Mr. Lane, *Colias Edusa* var. *Helice*, a nicely marked specimen. Mr. Whale, *D. albimacula; Heliothis armigera*, taken at Shirley; *Epunda lutulenta;* and a striking variety of *Mania maura*. Mr. Huckett, *Apamea ophiogramma*, *Apatura Iris*, and *Ennomos erosaria*. Mr. Cooper, *Macaria alternata*, *Cleora glabraria*, and *Lobophora sexalisata*. Mr. Macqueen, a case containing fifty species illustrating the *Lepidoptera* of our London gardens. Mr. Oldham, *Cymatophora ocularis* and *L. albipuncta*. Mr. Pratt, *Xylomiges conspicillaris*, *Cucullia gnaphalii*, *Eupithecia expallidata*, and a variety of *Pyrameis cardui* with the hind wings smoky. Mr. Meek, fine series of *D. albimacula* and *Meliana flammea*. Mr. Purdey, *Deiopeia pulchella*, and a variety of *Acronycta tridens* with a banded margin. Mr. Bryant, *Noctua ditrapezium*, *Cidaria sagittata*, *Eupithecia togata*, *Macaria alternata*, and *Anticlea sinuata*. Mr. Harper, varieties of *Liparis monacha* and *Limenitis sibylla*. Mr. Elisha, some fine series of various species. There were also a great many specimens of *Colias Edusa* exhibited, some of them varying more or less from the ordinary type. Mr. Trew exhibited a nest of wasps (*Vespa vulgaris*), with hibernating females. There was a very good attendance on both evenings; and the exhibition passed off very successfully.

species have two large eyes on the under side of the hind wings, one on the middle of the costa and the other near the anal angle. The larvæ have generally bifid tails, and are without spines. This subfamily is exclusively Tropical American, and, along with the *Morphinæ*, includes the largest of the American butterflies. They are robust insects, and generally fly at twilight.

The genus *Brassolis* (which was formerly placed alone in the family *Brassolidæ*, the remaining genera being referred to the *Morphidæ*) may be distinguished by its very small palpi; and the larvæ are destitute of an anal fork. The thorax and abdomen are very robust, and the antennæ are also thick, with a gradually formed club, so that one of the species has actually been mistaken for a *Castnia*. There are very few species known, all closely resembling the three old species, *Astyra*, Godt., *Sophoræ*, Linn., and *Macrosiris*, Westw. and Hew. The two first are about three inches and a half across; dark brown, with a broad tawny band on the fore wings, bifurcated on the cell, and running from thence to the inner margin. In *B. Astyra* the costa is much more strongly arched than in the other species; and the hind margin is slightly concave. *B. Sophoræ* has a narrower and redder submarginal band on the hind wings also. *B. Macrosiris* is a very heavy-looking, purplish brown insect, with two large round black spots surmounted by a smaller white one near the tip of the fore wings; and the apex of the hind wings, and a short line running from the costa of the hind wings just beyond the cell, are violet.

The genus *Opsiphanes* includes a number of species, much resembling *Brassolis*, but with broader wings and more slender bodies. They are nearly all brown insects, with a band, varying from buff to reddish orange, running from the middle of the costa of the fore wings, where it is often bifurcated, to the hinder angle, and generally a similar submarginal band on the hind wings. In *O. Syme*, Hübn., the band is submarginal on the fore wings also, and there is a shorter one within it; the hind wings of this species are suffused with blue in the male. In *O. Batea*, Hübn., all the wings are tawny to beyond the middle; and *O. Boisduvalii*, Westw. and Hew., is uniform tawny, with a dull brown spot near the tip of the fore wings. *Dynastor Napoleon*, Westw. and Hew., is an immense brown butterfly, with narrower fore wings and thicker body than *Opsiphanes;* it expands about seven inches. There is an interrupted pale yellow band across the fore wings, and the hind wings are broadly edged with orange; there are also a few orange spots near the tip of the fore wings. This is one of the handsomest and rarest of the Brazilian species. The other known *Dynastor*, *D. Darius*, Fabr., is a much smaller insect, about three inches and a half across the brown fore wings, with dull white spots on the outer half of the fore wings, and a white spot on the costa of the hind wings, from which a dull bluish stripe runs curving half-way to the anal angle.

Penetes Pamphanis, Westw. and Hew., is another fine and rare Brazilian species, with rather long fore wings, concave on the hind margin, and finely spotted with crimson; the hind wings are brown; the under surface is without eyes, being coloured nearly as above.

The genus *Caligo* contains some of the largest of the American butterflies, which may be recognised at once by the huge black eye on the middle of the hind wings beneath, containing a crescent of bluish white scales, and enclosed in a broad yellowish ring; the upper side is velvety black, generally suffused with blue towards the base of at least the hind wings; the fore wings are often buff or dull yellow towards the base, or the bluish portion is bordered with a streak of this colour. In *C. Atreus*, Koll., the fore wings are marked with a brilliant purple band, divided by a pale streak running up from the costa, and diminishing upwards; the hind wings are broadly bordered with orange, edged with black on the upper half. *C. Beltrao*, Ill., has the tip and hind margin of the fore wings bordered with orange, with an irregular black mark just before the tip. The species of *Caligo* measure from about five to seven inches across; those of *Eryphanis*, Boisd., are a little smaller, and the eye of the hind wings is much smaller, more oval, and generally connected with another small spot. The males are rich purple, bordered with black, and have an oval patch of yellow raised scales on the inner margin of the hind wings. The females are brown, sometimes dull blue towards the base, and generally with a yellow or orange band towards the hind margin of the fore wings; also visible in the male of *E. Æsacus*, H.-S.

Narope is a curious little genus, brown or dull fulvous, with pointed fore wings and angulated hind wings, much resembling the genus *Anæa* (*Nymphalinæ*) both in size and appearance; there is a tuft of hairs on the under side of the fore wings, and a large prediscoidal cell on the hind wings, Waiting for a change of weather, on the 8th of June we set off again, the weather rather better: a little more sun; still no quantity of any moths on the bank opposite the inn, which is, or has been, an entomologist's paradise. During a gleam of sunshine a moth came and dropped on a stone beside me, and behold it was *Miana expolita* (*captiuncula*); then another, and another. I thought I was in luck: however, during the three hours waiting, only three more came steering against the wind; and the strangest part of the affair was that the 9th of July used to be my set day for them, three miles from this place: and this in spite of such a cold season. In the evening *Eupithecia constrictata* was out, but very sparingly. This species was out, as well as *Hyria auroraria;* and was quite three weeks earlier than former years: the pupa must have been under the sun's influence more particularly this season. I went on to the moss-side to look for *Melanippe hastata*, but saw none; and have only seen one for a dozen years. I well remember Mr. C. S. Gregson and myself each taking about three dozen of this and *Leucophasia sinapis;* and why the latter has disappeared I know not. Some twenty-five years since I used to see them by five o'clock in the morning, flying softly along whilst I was dressing, just opposite my bedroom window. *Butalis fuscoæneella*, *Ennychia octomaculalis*, and, in the chinks of the rocks, *Psychoides verhuellella*, were to be found; the very common *Coccyx vacciniana* was only to be found by odd ones; I have known when a score could be taken in one sweep. We took a lot of larvæ of *Elachista adscitella* in the stems of grass (*Sesleria cærulea*), from which I bred over one hundred specimens. In the month of June a good many useful species turned up during several visits; a good many *Penthina prælongana*, *Phoxopteryx siculana*, *P. biarcuana*, *Lampronia luzella*, *Bucculatrix frangulella*, *Coleophora Wilkinsonella*, *Phoxopteryx uncana*, *Eupœcilia nana;* for first time among the birch many good *Nepticulæ*, and some larvæ of *Pterophorus tephradactylus*, quite a month later than usual. I had the mortification to see a lot of young larvæ of *Endrosis fenestrella* feeding upon my pupæ, and being only in time to save one. In Grange Woods there was little indeed to catch, *Grapholita obtusana* being very scarce; the only common *Tortrix* was *Ephippiphora cirsiana*, among the knapweed; two specimens of *Diplodoma marginepunctella* were flying softly under a shady nut-bush; and *Tinea semifulvella* on tree trunks, and flying in shady places along with *T. ganomella*. By sweeping *Elachista apicipunctella*, *E. humiliella*, *E. tæniatella*, *E. zonariella*, *E. subochreella*, and *E. Gleichenella*, turned up. In vain I swept and looked from morn till eve for *Coleophora fuscocuprella*, only taking one; I saw it walking on a nut-leaf. The same spot yielded me over fifty larvæ last September, from which I did not breed a single specimen. From among the *Helianthemum* I swept some fine *Butalis fuscocuprella* and *Laverna miscella;* the tops of the *Hypericum* were twisted in all directions with *Depressaria hypericella* larvæ.

The next excursion was early in June to the banks of the Wyre, near Fleetwood, to look for larvæ of *Gelechia instabilella* in the roots of *Plantago maritima*, and *G. ocellatella* in the leaves of *Aster tripolium*. By the way, I was greatly misled for years how to find *G. instabilella* larvæ: I have looked over acres of plantain leaves to no purpose, until one day I was looking earnestly at a lot of dead, yellowish brown roots, and it just struck me how the sea-pink looked when *Sericoris littorana* had been there. I at once broke off a dead root, and there was the fine yellow larva, with a black head, of *Gelechia instabilella*. I bred a nice series from this find. I may here note that I bred several specimens of *Ditula semifasciana*, from larvæ feeding on the wild carrot. I got them along with *Depressaria Douglasella*.

My next paper will be on July captures.

DESCRIPTIONS OF OAK-GALLS.

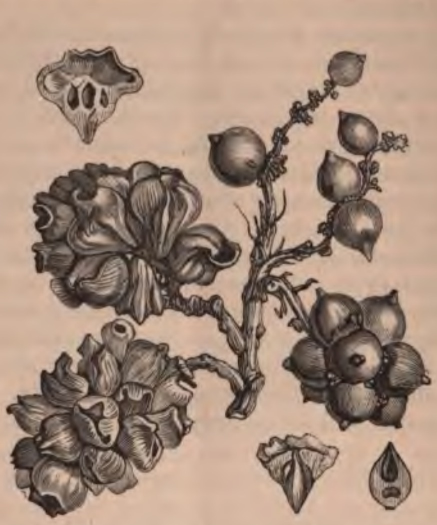
Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen.

By Edward A. Fitch.

(Continued from p. 16.)

79. *Andricus æstivalis*, Gir.—This gall may be found in great numbers, a short time after the blossom, on the thickened and shortened catkins of *Quercus cerris*. It occurs in such a manner that the galls being distributed, like the flowers, they together very much resemble a mulberry. Its shape is almost oviform, being 2 to 4 centimetres long by 1·5 to 3·5 broad. The single, greenish yellow or red galls are more or less pressed into one another, especially at the base, but are quite free at the apex. When mature each gall is cup-shaped, thin at the base, and expanding gradually to

the ragged rim. It is about 1 centimetre high, and has at the top of the rim of the cup a diameter of 6 to 8 millimetres. The under woody half of the upper empty cup is filled up, and contains some larva-cells. Dr. Giraud says, in his 'Signalements,' that he only found one larva-cell; but the smallest mature gall now before me contains more. Below this chamber a conical swelling rises in the cavity of the gall, at the bottom of the cup. When the gall is not fully matured only half of the cup shows, as you could imagine a vertical section of it: this bears a great resemblance to a scale of a fir-cone; at the bottom of this the germ of the larva-cell is to be found. The gall-fly appears at the end of June and in July.—G. L. MAYR.



Figs. 79 & 80.—Galls of *A. æstivalis* (to the right, at foot, an imperfectly-developed gall; and to the left, above, a specimen in vertical section). Galls of *A. grossulariæ* (and in section).

We now come to the catkin-galls. If we reckon the catkin specimens of *S. baccarum*, which has already been described amongst the leaf-galls (Entom. x. 206), there are ten species known to gall the oak flowers: two of these, this and the one next described, are confined to the Turkey oak. Hence it is not likely this gall occurs in Britain, although Mr. Cameron took an *Andricus*, near Loch Lomond, on May

ICHNEUMONS;

WITH DESCRIPTIONS OF THE PREVIOUSLY UNKNOWN SEXES OF TWO SPECIES.

By John B. Bridgman.

With what intense disgust are these lively and elegant insects generally looked upon by lepidopterists. How many look back with regret on the fine, rare moths they might have bred but for those "nasty" ichneumons, which, in most cases, are unfortunately immediately destroyed—a practice that is deeply to be regretted. If lepidopterists could be induced to save such ichneumons as they breed, and make a note of the species from which they were bred, a large amount of useful knowledge would be gained that is now quite thrown away, for no one has the same opportunity of making such valuable notes as the breeder of butterflies and moths.

I think it is a great pity that more of our working entomologists do not take to some of the less beaten paths of Entomology than *Lepidoptera* and *Coleoptera;* none are less devoid of interest, and many are more replete with it. Take, for example, the insects named at the head of this paper, and think for a moment of the important part they play in maintaining the balance of Nature; think of the enormous quantities of larvæ that are annually destroyed by ichneumons, which thus become valuable helps in keeping their numbers within bounds. It is not only the larvæ of *Lepidoptera* that are attacked, but those of sawflies, gallflies, flies, and beetles, are also destroyed. We cannot but admire the variety of forms that are met with. The majority are exceedingly graceful: their slender antennæ, which seem ever on the move; the colours of their bodies and legs are very pleasing,—black, red, yellow, and white, in almost every possible arrangement. The aculeus, or ovipositor, also varies exceedingly in length, size, and direction; in some it is considerably longer than the whole body, as in *Rhyssa*, *Glypta*, &c.; and this is very necessary for these insects, which deposit their eggs in wood-boring larvæ, such as the great sawfly (*Sirex*). From this elongated ovipositor every variation in length is to be found; some, indeed, have it not protruded at all: this is the case in many of the genus *Ichneumon* and *Tryphon*. Others have it quite straight, as in the genus *Cryptus*, those elegant Ichneumons which have the first segment of the abdomen petiolated, completely connect them as to render it altogether uncertain to which they more truly belong."—*Ray; Preface to 'Historia Plantarum.'*

Ideas to the same effect were subsequently avowed by Linnæus, Lindley, and a host of others, and have never been controverted; neither is it possible to controvert such a self-evident truth. Then, also, with regard to exceptions, these do and must occur without interfering with the general utility of a scheme. Some have said that the *exception* establishes the rule; but without going to the full extent of this apparent paradox, I entirely concur with its spirit, since I know that an insect may be legless, wingless, antennæless, without interfering in any manner with the propriety, or even the necessity, of arranging it according to the structure of these organs, or of neglecting or undervaluing the teaching of that structure or that economy which is most emphatically pronounced and most prominently displayed.

Too much stress can hardly be laid on the fact that *every character* must be consulted in the course of sub-division, or, what Cuvier calls, the "distribution" of the Animal Kingdom, not necessarily all at once, or all at every stage of the process of "distribution," but every character will occasionally crop up more prominently than the rest, and must then be utilised. In the foregoing remarks, structure and the arrangement of bones were thus utilised in my *first* division; number of legs in my *second;* metamorphosis will be employed in my *third;* combined with varied form and character of the mouth and food and economy in the *fourth.* It must not be inferred that no other differences than those mentioned exist in either case, but that these are the most salient, and appear most distinctive in those cases in which they are employed.

There can be no doubt that a "system of Nature" exists, but that the key to this system is not placed in our hands. The distinctive characters are Nature's, but the mode of employing them is man's, and man is very apt to go astray while attempting to discover and define the principles on which she works. It has, however, been shown by Cuvier that the animal kingdom is divided into four provinces, and Latreille in his last great work, the 'Causes d'Entomologie,' having shown that one of these provinces, *Exosteates*, is again a tetrarchy, the same will be adopted here without hesitation and without alteration.

(To be continued.)

a kind of manual for our own as well as continental observers. The index refers to seventy-eight distinct plant-genera; and altogether the pamphlet is of interest for perusal, as well as of value for reference.—E. A. O.

Sketches of Animal Life and Habits. By Dr. ANDREW WILSON. W. & R. Chambers: London and Edinburgh. 1877.

WE have before had occasion to notice works by Professor Andrew Wilson, who as a popular writer on Natural-History subjects has in this work excelled himself. This is saying much, when we know what he has already done towards creating a taste for the study of the most fascinating and beautiful of all the sciences. His style is such that many people on reading his books and scattered papers cannot fail to take a deeper interest in the, to them, hitherto despised atoms of life, which they have been passing as animated nothings. In these 'Sketches of Animal Life and Habits' Professor Wilson, in his usual pleasant and popular manner, leads us step by step from the lowest forms of life, as shown in the animalcules, which we may find in the water we daily drink, or which created such wonder when dredged from the deep sea by the members of the recent 'Challenger' Expedition, on by degrees to the higher reptiles; at which stage we leave "these cold-blooded creatures" for the higher animals. Though thus only noticing the lower half of animated Nature, he finds in it a text of such interest that his readers cannot fail to follow him to the end.

After treating of the lowest animals the author gives us some most readable chapters on "Sea Flowers," "Sea Eggs," "Sea Butterflies," &c.; coming to what will most interest the readers of this magazine in his chapters entitled, "Some Curiosities of Insect Life," and "Animal Disguises and Transformations." In these both the young and elder entomologist will find much to both instruct and interest him.

In recommending this little book to our readers, we would remind them that in pursuing their favourite branch of Natural History it is always well to try to understand the relation of each group of animals to its neighbours, thereby learning where one group ends and another begins, or where in the scale of Nature any particular group should be placed, and why it should be so placed. In this book Dr. Wilson gives many hints and suggestions, which will certainly lead many to extend their studies who were hitherto mere collectors of cabinet specimens. This work is the more interesting on account of its beautiful and numerous illustrations.—ED.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

THECLA PRUNI REPORTED IN HAMPSHIRE.—I observe in Mr. E. K. Robinson's interesting note on *Lepidoptera* near Petersfield, Hants, the mention of the capture of *Thecla Pruni* in that district. So far as I am aware the occurrence of this very local butterfly has not hitherto been recorded in Hampshire (its extreme range southward being apparently North Bucks); and speaking from my own knowledge of its habitats in the Midlands I do not think its presence in that county is to be looked for. Perhaps Mr. Robinson will kindly confirm or correct his note of its capture.—HAROLD CONQUEST; West Lodge, St. Ann's Road, Stamford Hill, N., December 13, 1877.

[Mr. Robinson thinks this an error of transcription when copying his list of captures. *Thecla Betulæ* was the species intended.—ED.]

ACRONYCTA MYRICÆ NOT A DISTINCT SPECIES.—The following extract from a letter received from Dr. Staudinger will be interesting to British lepidopterologists:—"Thank you kindly for the two specimens of *Acronycta myricæ*, Gn. I received before specimens of this species from England, and saw many there, and I find that they are quite identical with the alpine form of *A. euphorbiæ*, named *montivaga*, also by Guenée."—F. BUCHANAN WHITE.

CARPOCAPSA POMONANA AND HEUSIMENE FIMBRIANA.—Having put some larvæ of *Carpocapsa pomonana* in a large phial, I found on examination that two of them had entered the cork to become pupæ. Might they not likewise enter the bark of the apple trees in the same way? I was surprised last spring to find that I had bred four *Heusimene fimbriana* from a piece of worm-eaten oak bough, brought from Hendon, in February.—H. SHARP; 16, Huntsworth Terrace, Portman Market, London, January 14, 1878.

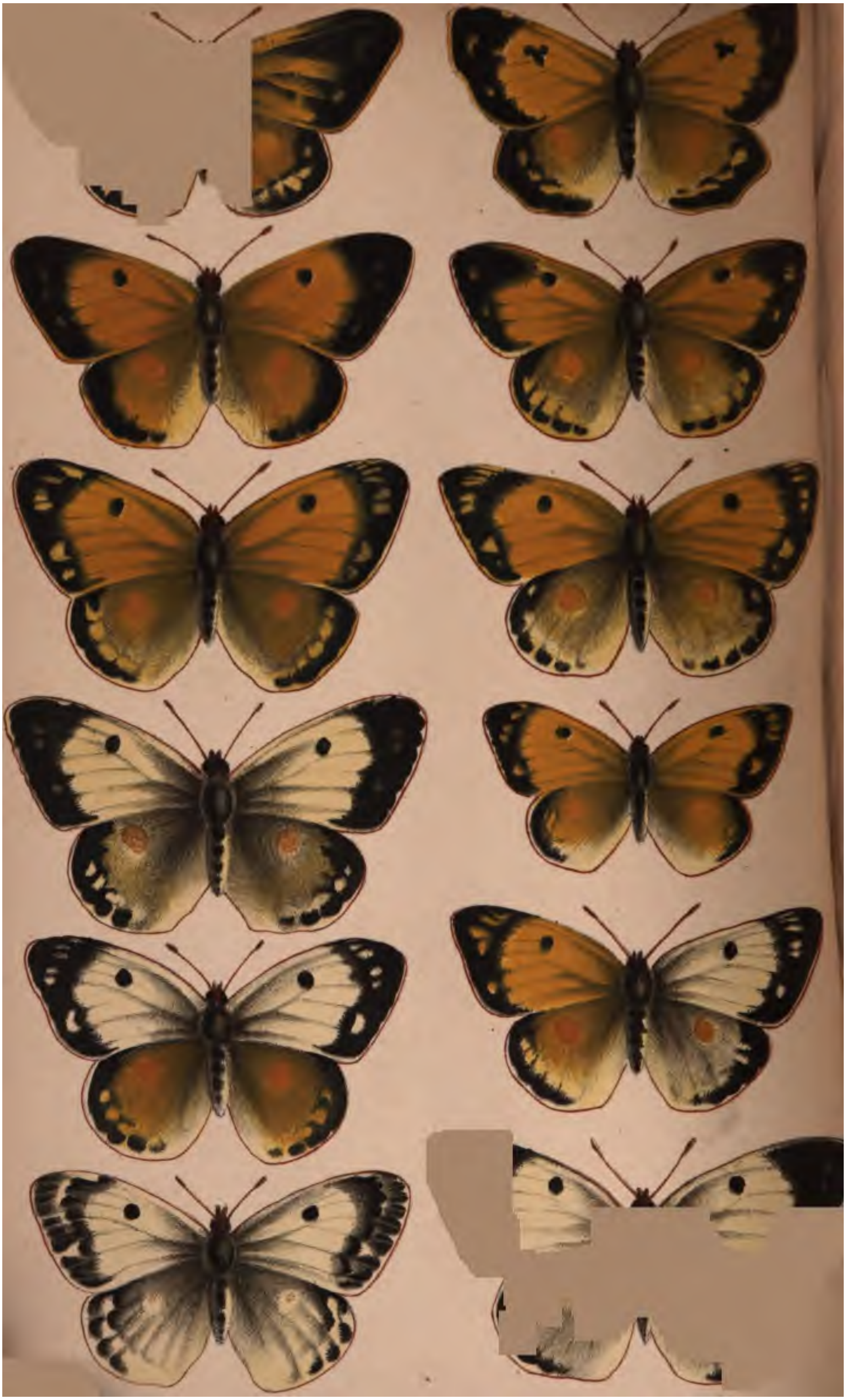
TINEINA REARED IN 1877.—*Harpipteryx scabrella.*—I bred a fine series of this from larvæ beaten from hawthorn, at Loughton, in the middle of June. *Antispila Treitschkiella.*—I am indebted to the kindness of Mr. Sydney Webb for the first supply of larvæ of this beautiful insect, and, profiting by it, I went at the end of September to a hedge in Kent, composed principally of dogwood, and collected a large number, which were then nearly full-fed. The mined leaves were placed on fine earth in a flower-pot, and covered with a glass cylinder: as the larvæ cut out their cases the leaves were removed. The pot was kept exposed to the full influence of the weather, till the emergence of the moths in July, when I reared a large number.—WILLIAM MACHIN; 22, Argyle Road, Carlton Square, E., January 24, 1878.

THE BRITISH HEMIPTERA-HOMOPTERA.—While agreeing generally with what Dr. Power has said (Entom. xi. 2), I yet take exception to his deterrent remark, that of the British *Homoptera* "we have scarcely even a satisfactory catalogue, much less description, of those which are known." All the species of *Cicadaria* and *Psyllina* known up to 1876 to inhabit Britain are included in the synonymic 'Catalogue of British Hemiptera,' published by the Entomological Society of London in that year; and, except the oldest and well-known species, all have been described in the 'Entomologist's Monthly Magazine' and the 'Transactions of the Entomological Society.' With respect to the *Aphidina*, Mr. Buckton's 'Monograph of the British Aphides,' published by the Ray Society in 1876, is a good contribution to our knowledge; and when this is completed all that will be wanting will be a proper list and descriptions of the few British *Coccina* and *Pediculina*. There exist, therefore, abundant guides for those who are disposed to leave the beaten track, and work in a field that offers rich inducements to investigators.—J. W. DOUGLAS; 8, Beaufort Gardens, Lewisham, January 5, 1878.

BLOTCHED HOLLY-LEAVES.—I in no way exaggerate if I say that quite fifty per cent. of the holly-leaves that came under my notice last year were blotched by *Phytomyza obscurella*, Fallen. I noticed this in many localities, both in Essex and Middlesex. When these affected leaves were used in church or room decorations they soon had a very scorched and withered appearance. This year I have scarcely seen a single holly-leaf tenanted by the *Phytomyza*. The meteorological conditions were probably unfavourable for the oviposition of the little dipteron, although they were so favourable for the flowering and fruiting of its food-plant. The fly emerges in May and June, a little later than the collection of the Coleopterous Insects of Madeira, 1857; that of the 'Coleopterous Insects of the Canaries,' 1864; the 'Coleoptera Atlantidum' (enumerating those of the Madeiras, Salvages, and Canaries), 1865; and the 'Coleoptera Hesperidum,' 1867 (enumerating those of the Cape Verde Archipelago). His collections and types being purchased for the National Collection, his works on the *Coleoptera* of Madeira and the Canaries were published as British Museum Catalogues. His volume on the 'Variation of Species,' dedicated to Mr. Charles Darwin, and published in 1856, is well known. His shorter papers of original research and critical disquisition—contributed to our own, and in some cases foreign, scientific journals—range over a period of more than thirty years, beginning with Notes in the 'Zoologist,' on the *Coleoptera* of the South of Ireland, of South Wales, of some districts of the West of England, and of the South of Dorsetshire. Many papers—relative to the "Coleoptera of the Canary and Cape Verde Islands, and Madeira;" on the "Atlantic Cossonides" (to which he especially directed his attention); on "Some of the Coleoptera from the Cape of Good Hope;" with others on "Structural Peculiarities," "Variation of Species," "Revisions and Notes of Diagnostic Characters;" showing the unwearied research of their author —followed in the 'Annals and Magazine of Natural History' and other serials; till the long record of skilful labour ceased with his paper on the "Sphenophorus striatus," the recently arrived Banana weevil of Madeira, forming a contribution to the Economic branch of Entomology, of which he watched the progress with deep interest. In the autumn of 1875, feeling it desirable to seek a warmer climate, he devoted himself to utilizing his time to the utmost in scientific research, and every assistance to investigation being furnished him in St. Helena, through the assistance of Lord Carnarvon, the governor's residence ("Plantation House"), within an hour's ride of the grand central ridge, still clothed with the aboriginal vegetation, was placed at his disposal; and he devoted himself assiduously to his work, in the companionship of his accomplished wife, herself a skilful lepidopterist, and his old friend and previous companion Mr. John Gray. His wife, to whom he was married on the 12th of January, 1869, and who entered most heartily into all his pursuits as a naturalist, was a daughter of Joseph Shepherd, Esq., of Teignmouth. Of this work we have the record in the 'Coleoptera Sanctæ-Helenæ,' which may well be taken for a devoted to it, and his friends and fellow-workers in the same wide field, his interest was unfailing in their welfare, and the advance of scientific progress. He was a man of highly refined and accomplished mind, as well as of great scientific attainments, and will be greatly missed from the ranks of our leading naturalists, as well as by those less gifted than himself, whose progress he aided by his encouragement and sound counsel.

MR. ANDREW MURRAY, F.L.S.—It was with much regret we received intelligence of the death of this accomplished naturalist, which took place at his residence, 67, Bedford Gardens, Kensington, on the 10th of January last. His health had not been strong since a severe illness following on his return from his American expedition of 1873. In the course of the last season further indisposition followed, and he gradually sank; but so assiduously occupied with his labour of scientific usefulness to his latest days, that few but those intimately acquainted with him were prepared for hearing of their close. Mr. Murray was the eldest son of William Murray, Esq., of Conland and Duncrievie, N.B., and was born in Edinburgh, on the 19th of February, 1812. Few particulars are known to us of his life in Edinburgh, where he resided till 1860; but as with most lovers of natural science this predilection asserted itself in his early years. He was educated for the law, but devoted some attention to the study of medicine, and attended the Edinburgh scientific lectures, of which, judging by the reminiscences of his later life, he must have been an attentive hearer and careful analyst. During the last few years of his life in the northern capital he was very active scientifically. In 1858 he was elected president of both the Botanical Society and Physical Society; and just previous to his removal to London he contributed an elaborate paper to the Royal Society of Edinburgh on the "Pediculi Infesting the Various Races of Man," which gave minute descriptions, and the specific variation of these creatures relative to the subject then under discussion, as to how far unity of species in the parasite showed unity of species in the animal preyed on. In 1860, as has been said, Mr. Murray came to London, and was appointed assistant-secretary to the Royal Horticultural Society. It was from this time that he devoted himself more especially to his work as a scientific botanist and entomologist, and became celebrated in the former as the monographer of the *Coniferæ*, in the latter as the monographer of the shaping the aid placed at his service by those less gifted than himself, in the details of field observation, and of museum illustration by coloured drawings or fac-simile modelling. This collection is already a nucleus of a very valuable, popular, and illustrated history of insect friends and insect foes; the practical value of which will generally perhaps be better appreciated in time to come, but which is already bearing good fruit for public benefit. Our countrymen in America, thanks to State help, have indeed set an example for following, and given an instance of the practical importance of Entomology. The labours of Walsh, Riley, Fitch, and Packard, leave us far behind; but the perfection of such a collection as the one now under government control would be a worthy exponent of practical Entomology in Britain. On this collection, of which one hundred and fifty cases are more or less complete, Mr. Murray was working up to his latest days, leaving a large collection of oak-galls and illustrative drawings still in progress of arrangement. To assist in the circulation of information a series of guides to the collection were projected. These were to take the form of popular handbooks to Entomology, and were to be prepared by Mr. Murray, and published under government supervision. Of the eight intended volumes one only has appeared: this treats of the wingless species, or *Aptera* (it was reviewed, Entom. x. 102). In Mr. Murray we have lost a man of varied accomplishments, a good botanist, and a good entomologist, especially with reference to *Coleoptera*. Those who knew him well, and they were many, will feel his loss, not only as a gifted naturalist, but as a true-hearted friend and an admirable man.—E. A. F.

James Robinson.—After a painful illness there died at York, on the 14th of last October, James Robinson, aged fifty-nine years. For the last twenty-four years he was well known in the North of England as a careful collector and patient observer of *Lepidoptera*. All the spare hours from his work, as a cabinet-maker, were spent in following his favourite pursuit of Natural History. Born at Ripon, and living in York most of his life, he restricted his observations almost entirely to his native county; but there are few localities, reasonably accessible, near York, which he has not explored by night or by day. Being a genial companion, and always ready to impart to others the knowledge gained by hard experience, he is much missed by the little band of workers in Natural Science at York.—Ed.



more to its association with that mystical number than any actual experience:—

> "Of every beast, and bird, and insect small,
> Came *sevens* and pairs."—MILTON.

These periods were supposed to be influenced by the eggs or pupæ of the species lying dormant; but our knowledge of *Colias* will warrant us in considering them all as arbitrary and unsupported by facts. We know that many *Lepidoptera* pass two or more years in the penultimate state, *Bombyces* especially, and that some few take more than one year to complete their metamorphosis. These species are very probably affected in their appearance meteorologically, as no doubt is *Colias;* but we want more knowledge of our two species to say that the favourable conditions are this only.

In 1872 we were astonished by an unusual abundance of *Vanessa Antiopa.* Of late years we have had many well-attested observations of the migration of butterflies; and it is this which probably affects the appearance of *V. Antiopa, Pieris Daplidice, Argynnis Lathonia* (all unusually abundant in the autumn of 1872), and other *Lepidoptera,* in Britain. Some few find the conditions of their new establishment favourable, and establish themselves; but probably unless strengthened by new recruits every now and again we should soon lose these and other species from the British fauna. *C. Edusa* has been met with more than once in the English Channel travelling from the Continent. The following is on the excellent authority of Mr. Charles Darwin, when on his 'Beagle' voyage:—"One evening, when we were about ten miles from the Bay of San Blas, vast numbers of butterflies, in bands or flocks of countless myriads, extended as far as the eye could range: even by the aid of a glass it was not possible to see space free from butterflies. More species than one were present, but the main part belonged to a kind very similar to, but not identical with, the common English *Colias Edusa.*" It is these migratory habits and a strong constitution which account for the extended geographical distribution of *Colias. Edusa* and *Hyale* are both common to the three continents of the Old World, and very closely-allied species are found in the New. Although originally an immigrant, from the great abundance and distribution of *C. Edusa* in Britain and Ireland, it may now be considered as thoroughly naturalised; and the numerous specimens captured last year were doubtless mostly British born. Of these I have seen some hundreds of specimens, and they vary in almost every conceivable detail.

retains seventeen; Kirby enumerates fifty-five, twelve of which are European. Could we but get series of each supposed species, such as could be procured of *C. Edusa* this year in Britain, and allowing for the variation attributable to geographical distribution or climatal causes, it is more than likely that the most discriminating speciologist would be baffled. As an instance of community of descent the series would be perfect. Should a great *Hyale* year, as were 1842 and 1868, occur before our *Edusa* experience is forgotten, we may probably deduce some knowledge from our own two species. We certainly now have *C. Edusa* varieties resembling in almost every detail *Chrysotheme*, Esp., *Myrmidone*, Esp., and even the light yellow *Erate*, Esp. I have also seen several males with such a distinct purple gloss, and with the mealy borders to the wings, that they certainly approach *Aurorina*, H.-S., though perhaps in a mild form. It has been said that *Erate* is a hybrid between *Edusa* and *Hyale;* it is most certainly a connecting link between the two species.

"The boundaries (*grenzen*) between the species of this genus (*Colias*) are very uncertain; the more one compares examples from various localities the more inconstant appear the specific characteristics, which suffice to distinguish the ordinary species" (Schmetterlinge von Europa, vi. 21). So says Dr. Herrich-Schäffer in his beautiful work. The clouded yellows are generically identical, but as our knowledge of them increases the question will soon develop itself—Are they specifically dissimilar? Many which are now recognised as good species will, like our *Helice*, have to descend from specific to varietal rank. Were our small, pale, narrow-bordered, third brood of **1877** perpetuated in a higher latitude or altitude, we should probably have quite as distinct a race as any known *Colias*. In 1877 *Helice* was taken *in cop.* with male *Edusa;* and, what is more convincing, I learn through Mr. Meek, that Mr. Gates, of Brighton, bred a male *Edusa* from an egg laid by *Helice*. From eight or ten eggs only one reached the pupa state.

Before summarising last season's results a retrospect of the occurrence of the species in Britain may not be without interest. *C. Hyale* was common in 1821, 1826, 1828, 1835, **1842** (particularly so, but no *Edusa* seen), **1843** (many, also *Edusa*), **1844** (several, *Edusa* much the commoner, as in **1843**), **1847**; in **1849** there were a few, **1851** (one record), **1855** (rare, *Edusa* common), 1856 (two records), **1857** (very common, as also was *Edusa*), 1858 (common), 1859 (one record), **1867** (one record), 1868 (very abundant, *Edusa* was not common), 1869 (one record), 1870 (scarce), 1872 (common, not so *Edusa*), 1875 (abundant), 1876 (common). *C. Edusa* was abundant in 1804, 1808, 1811, 1825 (one), 1826 (very abundant), 1831 (plentiful), 1833, 1835 (both species common), 1836 (common), 1839 (common, many in June), 1843 (abundant), 1844 (very common), 1845 (scarce), 1847, 1848 (one record), 1851 (one record), 1852, 1855 (common), 1856 (common), 1857 (very common, recorded to November 18th), 1858 (very common, particularly in June, also to November 7th), 1859 (very abundant), 1861 (scarce), 1862, 1865 (common), 1867 (several), 1868 (common, but *Hyale* much more so), 1869 (several), 1870 (scarce), 1871 (one record), 1872 (not uncommon), 1875 (very common), 1876 (common). These records are collated from the 'Magazine of Natural History,' the 'Entomological Magazine,' the 'Entomologist,' the 'Zoologist,' the 'Entomologist's Weekly Intelligencer,' the 'Weekly Entomologist,' and the 'Entomologist's Monthly Magazine.' They are ample to show distinctly the capriciousness of the occurrence of these two insects in Britain.

The following are selected records for 1877:—

BUCKS.—Common near Marlow, from beginning of August to end of September; fifty-five taken; *Helice* occurred in about the proportion of one to twenty: F. N. Jackson.

CARNARVON.—A freshly-emerged *Helice*, taken at Bangor on 3rd October; the only *Edusa* seen in Wales during a fortnight's stay: S. D. Bairstow.

CORNWALL.—Common at Penzance, also seen within a short distance of the Land's End; second week in September: H. Miller, jun.

DERBY.—Taken in Darley Abbey Gardens; last taken 9th September: S. J. Rowberry.

DEVON.—A tattered individual, seen near Torquay, about the 5th or 6th May; several fine bright males seen at the end of the month, and the species became common by the middle of June; very abundant during the summer; several seen on October 14th; the last on October 29th: G. B. Corbin. A friend tells me *Edusa* was out and common, at Sidmouth, the second week in October: H. T. Dobson, jun.

DUMFRIESSHIRE. — Common this year throughout the district; not seen previously since 1862; first seen June 3rd; in scanty numbers throughout June, July, and August; the autumn brood was very common from September 10th to October 9th: R. Service.

ESSEX.—Seen on the wing, but very much worn, on October 8th and 14th; and on October 24th a fresh male was caught at Wrabness, near Harwich: F. Kerry. Common at Walthamstow; last noticed October 5th; one *Helice* taken September 15th: B. Cooper.

GLOUCESTERSHIRE.—Very common near Ailberton and Lydney; first seen June 3rd; it disappeared from the first week in June to the end of July; from then to October 3rd, very common; only one *Helice* seen, October 2nd: Rev. D. G. L. Browne. Common at Wotton-under-Edge until October 4th, on which day I took five specimens: V. R. Perkins. At Cheltenham, in September: Rev. D. G. L. Browne.

HANTS.—Abundant at Lyndhurst; last seen October 3rd: H. Golding-Bird. Seen near Buriton on October 6th: F. N. Jackson. Very abundant in July and August: G. B. Corbin.

HEREFORDSHIRE.—Very common in August and September, commoner than whites; I saw one in the centre of the city of Hereford: J. B. Pilly. First observed June 8th; last seen October 9th: Rev. C. Kengelbacker. Common on June 10th; seen previously; one taken by my brother the last week in May: P. H. Horne.

ISLE OF WIGHT.—I saw several worn *Edusa* and one *Helice* at St. Helen's, on September 26th: H. Golding-Bird.

KENT.—Swarmed at Herne Bay in August; my brother took a fine series of *Helice* there: B. Cooper. Folkestone, equally fresh specimens taken the first week in June, August, and October; very common on October 20th; two specimens taken just after emerging, on the morning of October 2nd: W. Blackall. Very abundant at Ramsgate and Margate; last seen September 15th: R. T. Gibbons. Very abundant at Folkestone; seventy-eight captured during September, also *Helice;* one taken on November 4th, very fresh: W. J. Austen. In great numbers round Strood; I know of one thousand five hundred captures, including twelve or fourteen *Helice;* second brood appeared at the end of July; one captured November 2nd: J. Ovenden.

KIRCUDBRIGHTSHIRE.—At Arbigland, on the Galloway coast, I was told by the gardener it outnumbered the common whites: R. Service.

LEICESTERSHIRE.—Very common round Leicester, one was taken in the centre of the town itself; first seen June 9th, three taken in the month; not seen in July; fifty-seven *Edusa* and confirmed (Entom. ix. 256, 257). At the first subsequent opportunity I ventured to solve my own problem, and not without some success. Above I have given a tolerably complete history of two broods.

The year 1877 has taught us that *C. Edusa* is normally double-brooded, and occasionally triple-brooded. But how does it pass the winter? As an egg, as now instanced; as a larva, as related by the Rev. J. Hellins (E. M. M. vi. 232); as a pupa, as related by Mr. C. W. Dale (Id. v. 77); or as an imago, as related by Mr. J. Cranstone (Ent. Intell. ii. 11) and Mr. R. R. Harvie (Id. ix. 179)? This point shall be returned to; but enough has been said to show the necessity of more observers.

Maldon, Essex, January 1, 1878.

Hastings, 1877.—In August and September last *Colias Edusa* was very abundant in this neighbourhood, and amongst them I was fortunate enough to capture eight of the variety *Helice*, all in a perfect condition, and one of which is of a bright saffron-colour. A friend who was with me at the same time also succeeded in taking six *Helice*. On the 17th of October I captured four, all very perfect; one of them when taken had the empty pupa-case beside it, and its wings were quite limp. On the following day I took another, also with the pupa-shell beside it. The last *Edusa* taken was on the 17th of November, when I left the neighbourhood. This, notwithstanding the lateness of the season. The following is my full record:—August 2nd, seven specimens taken; 3rd, seven; 4th, fourteen; 6th, twelve; 7th, eighteen, and one *Helice;* 8th, fourteen; 9th, nine; 10th, twelve, and one *Helice;* 11th, five; 13th, eight; 14th, eight; 15th, two; 16th, three, *Edusa* eggs laid; 17th, ten; 18th, sixteen; 20th, twenty-six, and one *Helice;* 22nd, *Edusa* larvæ out; 23rd, fifteen; 24th, six, and one *Helice;* 25th, six, and one *Helice;* 30th, five, and one *Helice* (saffron colour). September 1st, eleven, and one *Helice;* 5th, two, and one *Helice;* 6th, thirteen, *Edusa* eggs laid; 7th, four; 11th, four, and two *Edusa* larvæ; 16th, larvæ out; 18th, one nearly full-fed larva taken; 27th, first larva fixed for changing; 29th, three, first larva turned to pupa. October 5th, eight, second larva fixed for changing; 6th, two; 7th, second larva turned to pupa; 9th, two; 10th, four; 11th, eight; 17th, four, one just out, with pupa-shell; 18th, eight, *17. Leistotrophus cingulatus, *Grav.*—Rev. A. Matthews, Mag. xiv 38. Devonshire, Rev. H. Matthews. *One specimen.* North America. 1877.

18. Scopæus Ryei, *Woll.*—T. V. Wollaston, Mag. ix 34, and An., 1873, 24. Slapton, T. V. Wollaston. 1872.

19. S. subcylindricus, *Scrib.*—E. C. Rye, Mag. x 138, and An., 1874, 82. Ascribed to England in 'L'Abeille.' 1873.

20. Lithocharis picea, *Ktz.*—E. C. Rye, Mag. ix 156, and An., 1873, 24. Bexley, G. C. Champion. 1872.

Acidota ferruginea, Er.—E. C. Rye, Mag. ix 190, and An., 1874, 82. Scarborough, R. Lawson, probably is *var.* of A. cruentata. 1873.

Bryaxis cotus, De Saulc., &c. (Sharp MSS.).—D. Sharp, Mag. xii 225, is B. Lefebvrei of Sharp Cat., returned as a new species by M. de Saulcy. 1876.

21. Euplectus Abeillei, *De Saulc.*—D. Sharp, Mag. xii 225, returned as such by M. de Saulcy. Mickleham, D. Sharp. *Two specimens.* 1876.

22. E. piceus, *De Saulc.*—D. Sharp, Mag. xii 125, returned as such by M. de Saulcy. New Forest, D. Sharp. 1876.

23. E. Duponti, *Aub.*—D. Sharp, Mag. xii 225, returned as such by M. de Saulcy. Scarborough, R. Lawson. 1876.

24. Scydmenus helvolus, *Schaum.*—D. Sharp, Mag. xii 225, returned as such by M. de Saulcy. 1876.

25. S. Sharpi, *De Saulc.*—D. Sharp, Mag. xii 225, returned as such by M. de Saulcy. R. Lawson. 1876.

S. glyptocephalus, De Saulc.—D. Sharp, Mag. xii 225, returned as such by M. de Saulcy, is S. carinatus of Sharp's Cat. and of List, An., 1872, 165. 1876.

26. S. præteritus, *Rye.*—E. C. Rye, Mag. ix 6, and An., 1873, 25. Croydon and Seaford, on chalk, E. C. Rye and E. Waterhouse. 1872.

Trimium brevicorne, Reich.—D. Sharp, Mag. xii 225, is male of T. brevipenne, *Chaud.*, which, therefore, must be omitted. 1876.

27. Trichopteryx carbonaria, *Matthews.*—Rev. A. Matthews, Mag. ix 179. Thoresby, Rev. A. Matthews. *One specimen.* 1873.

28. Ptilium cæsum, *Er.*—Rev. A. Matthews, Mag. ix 179, and An., 1874, 84. Cambridge, Crotch. P. cæsum of former lists is P. inquilinum, *Er.* = P. myrmecophilum, *All.* 1873.

29. Anisotoma lunicollis, *Rye.*—E. C. Rye, Mag. viii 203,

years, and thus obtain eighty-three notices. Of these, twenty-four are changes, or corrections, of names which were previously in our catalogues; and fifty-nine refer to insects absolutely new to our list. Of these, however, two ought to be excluded, as referring to merely single specimens of undoubtedly American insects, viz., *Leistotrophus cingulatus* and *Clytus erythrocephalus;* and two others, as relating to single specimens of insects known as foreigners, but without any trustworthy British history, viz., *Platysoma oblongum* and *Agapanthia micans.* Again, three others are undoubtedly to be considered as merely introduced, and scarcely naturalised, and as having no claim to be supposed British insects proper, viz., *Silvanus advena*, *Ptinus testaceus*, and *Tribolium confusum.* We have, thus, fifty-two for the absolute number of genuine additions in six years, and it is not improbable that a few of these will be ultimately reduced; new species having in several cases been founded on single specimens, or by the separation of insects which had been previously grouped under one name; the differences being occasionally not of a very decided character, and some of them possibly merely sexual. Thus two species of *Trimium* have been reduced into one, as representing only the sexes; and *Meligethes palmatus*, Er., is identical with *M. obscurus*, Er., on the same grounds. We thus obtain an average of not quite nine, for each of the last six years; a great contrast to that of fifty-five, as recorded for the previous seventeen years, in the list of the 'Entomologist's Annual' of 1872. This would seem to indicate either that the new species are becoming pretty well worked out, or that there has been a great lull in collecting activity, which I suspect is the case.

The only name which stands out prominently is that of that indefatigable collector Mr. Champion, assisted by his friend Mr. Walker; Mr. Lawson has done much. Mr. Crotch and old Turner are, alas, lost to us; Dr. Sharp and Mr. Gorham have ceased to give much exclusive attention to British insects; Mr. Rye has now little or no time for personal collecting. All of these are men who used to add largely to our discoveries, and they have not yet been replaced.

If we analyse our Catalogues we shall find that in

1872	there were	18	new insects, and	9	changes of name.
1873	„	13	„	7	„
1874	„	5	„	2	„
1875	„	4	„	0	„
1876	„	15	„	6	„
1877	„	4	„	0	„

It would seem then, that there have been slight outbursts of British energy in the years 1872, 1873, and 1876; but during the last year a state of almost absolute stagnation.

There must be a wide field of discovery yet open in Ireland, the northern parts of Scotland, and even in Wales, which are almost unexplored in comparison with the more populous districts of England; and let us hope that at the end of another six years we shall have to record a revival of entomological ardour, and a large increase in our averages. It will be observed that the determinations have been made principally by Mr. Rye or Dr. Sharp, whose critical acumen, and extensive entomological knowledge and experience, has rendered them the almost universal referees of less accomplished British coleopterists, or of those who have not access to the books, &c., necessary for identifying the novelties which they recognise as the result of their collecting.

52, Burton Crescent, January, 1878.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

LEUCOPHASIA SINAPIS AT REST.—With reference to *Leucophasia sinapis* the late Mr. Newman used to say that it had never been observed at rest. On the 5th of August, in Stubby Copse, I touched with a stick what I thought to be a bleached specimen of *Pseudopterpna cytisaria* at rest on some stunted grasses in one of the ridings. It turned out to be rather a dull specimen of *L. sinapis*, resting with the wings brought down to the sides, in this respect resembling no other butterfly with which I am acquainted.—H. WHITTLE; 20, Cambridge Terrace, Lupus Street, S.W., Feb. 12, 1878.

ACRONYCTA MYRICÆ.—Guenée described *Montivaga* as a variety of *Acronycta euphorbiæ*, and *A. myricæ* as a distinct species, and my specimens so far agree with him that my *Montivaga* are all lighter than *A. myricæ;* nevertheless it has long been supposed that *A. myricæ* is merely the dark insular form of *A. euphorbiæ*, and Dr. Staudinger has already noted the supposition in his Cat. Lep. Europ. of 1871; but he does not even yet say that the identity has been proved by breeding; and until this is done it must, in such a family as the *Acronyctidæ*, remain matter of doubt.—N. F. DOBREE; Beverley, February 4, 1878.

ZYGÆNA FILIPENDULÆ DOUBLE-BROODED.—Having never before met with a second brood of *Zygæna filipendulæ* in this country, I think it may be worth recording that I took

Society. And I do sincerely trust that, in working up this favourite group of mine, they will obtain large additional assistance from all quarters, which must bring in a great number of new species, without anyone being "deterred" by my remarks.—John A. Power; 52, Burton Crescent, February 13. 1878.

Injurious Insects.—We are glad to be enabled to state that the plan of recording observations relative to the best means of counteracting the attacks of injurious insects, to which attention was drawn in a pamphlet published in June last (see "Practical Entomology," Entom. x. 166), has been acted on far more successfully than could have been hoped for on a first trial. Practical observers, both in England and Scotland, have come forward, and some useful information has already been gained. This is embodied in a Report recently published for the observers, which, at the request of the promoters of the plan, will be furnished gratuitously to applicants (with sheets for entry of observations, and the original pamphlet of notes for points to be observed) by Mr. T. P. Newman, 32, Botolph Lane, Eastcheap, E.C. Assistance has already been promised for the coming season; and any observations which may be kindly furnished by practical entomologists and agriculturists will be a valuable aid, and gratefully received for incorporation in the next Report.—Ed.

National Entomological Exhibition.—We would draw our readers' attention to the Exhibition which will open on Saturday, March 9th, at the Royal Aquarium, Westminster. The applications for space already received far exceed the most sanguine expectations. All orders of insects will be represented in collections varying in size from one insect to sixty cabinet drawers. This, the first general entomological exhibition ever held, will afford a good opportunity for students to compare notes and extend their knowledge. The fauna of almost every part of the United Kingdom will be represented, typical collections having been entered from remote districts. The last day for receiving applications for exhibition space will be Thursday, March 7th; so we would urge intending exhibitors to lose no time.—Ed.

The Doubleday Collection.—This valuable collection of *Lepidoptera*, still deposited at the Bethnal Green Museum, was specially consulted by 1492 visitors during 1877.—Ed.

completely across the wings. This last-mentioned variation is, however, not uncommon; and I possess several specimens of *C. villica* with a similar streak in the hind wings.

It is difficult to offer any reasonable conjecture as to what may have been the "exciting cause," as Dr. Buchanan White terms it (Ent. Mo. Mag. xiii. 148), of such an aberration as the above from the ordinary form of the species. The larva which produced this specimen was obtained, with several dozen other larvæ of the same species, from one locality, near Brighton, and was fed up with them, on the same food-plants, in one breeding-cage. It was, therefore, subjected to the same conditions as to nutriment, light, humidity, and temperature, as the others, not one of which, however, produced any noticeable aberration from the type of the species.

Having regard to these facts, I am inclined to think that the colorational peculiarities of this specimen must be considered as the result of a diseased condition of its larva; they cannot be attributed to causes similar to those* constantly operating in certain districts, in the production of melanic or melanochroic forms; nor to any special conditions of food, light, or temperature, to which, in any locality, a larva in a state of nature may, under peculiar circumstances, be subjected.

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. Kirby,
Assistant-Naturalist in Museum of Science and Art, Dublin.

No. VII. NYMPHALIDÆ—ACRÆINÆ.

The *Acræinæ* are a rather small group of long-winged butterflies, generally of some shade of fulvous, with black spots, or black, with white or yellowish markings, and the hind wings beneath either striated, or spotted with black at the base. The fore wings are partially transparent in some species. The palpi of the imago are thick and scantily clothed with hair, and the larvæ are spiny. The genus *Acræa*, as it stands, is too extensive, but it cannot yet be satisfactorily subdivided, though we may retain the name *Actinote*, Hübn., for the South American section, with of the fore wings is broken into spots by the veins, and by transverse dusky markings. There are no black spots at the base.

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* *I.e.*, the geological formation of a district, and the nature of its mineral productions (if any); its geographical position, and the prevailing character of its climate and vegetation.—H. G.

The genus *Alæna* only comprises two little species from Central and Southern Africa, which do not expand much more than an inch at the outside. *A. Amazoula*, Boisd., from Natal, is taken flying among long grass, like a skipper, which it also resembles in coloration, being brown, with a row of elongated tawny spots on the hind margins, and longer ones running from the bases and inner margins of the wings; the under side is more uniformly yellowish, paler, and divided by the nervures, but there are no black spots.

The South American genus *Actinote*, which is likewise destitute of basal spots, and in which the hind wings are always very distinctly striated, at least on the under surface, may be divided into two groups. In the first, represented by *A. Thalia*, L., the fore wings are brown, tawny, yellowish, or reddish at the base and inner margin, more or less divided into spots by the veins, and with a transverse paler band near the tip; the hind wings are of the same colour as the base of the fore wings, divided by the nervures, and often by intermediate black lines, with a rather broad, black hind margin. *A. Thalia*, being apparently a protected species, is mimicked by several other *Lepidoptera*, among which is a *Dismorphia* (*Pierinæ*) and a *Castnia* (a moth). In the second group the wings are bluish black, and the hind wings are unspotted above, though with short diverging yellow streaks at the base beneath in several species; the fore wings have the centre of the wings pink or red, the colour generally extending to the base, and there is sometimes a transverse band of the same colour beyond the red portion. In *A. Neleus*, Latr., the red basal portion of the other species is replaced with a shade of blue, rather paler than the ground colour, but, on the other hand, the abdomen is reddish. In *A. Leucomelas*, Bates, the fore wings are bluish black, with two or three long yellowish streaks placed obliquely at the extremity of the cell.

NOTES ON ARCTIA LUBRICIPEDA.*

By Edwin Birchall, F.L.S.

The larva occurs in great profusion in the Isle of Man, but I have met with comparatively few of the perfect insect; and in order to learn whether this scarcity was real or only

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* Read before the Lancashire and Cheshire Entomological Society.

It is difficult to specify the causes of the heavy mortality amongst larvæ, especially in the case of ***Lubricipeda***, which appears to be a protected species, and has thus become one of our most abundant and widely-distributed moths. Being polyphagous it can rarely suffer from want of food. When young they feed in companies; and both the eggs and the young broods are probably swallowed wholesale by browsing animals. Nature seems to think it no waste to sacrifice a thousand of their lives to feed a donkey; possibly the young caterpillars give a relish to his dock-leaf.

I do not know whether small birds dislike the young larvæ, but when fully grown it is, with other hairy caterpillars, distasteful to many birds, and seems to walk the paths and climb the walls unmolested. Whether the dislike of these caterpillars evinced by birds is owing to some disagreeable taste or smell, or to their hairy coats, seems doubtful. When thrown to domestic fowls I notice that in the first rush to secure a share of what they probably think is a distribution of ordinary food, the young birds will generally swallow a few; but as soon as the excitement is over, and they take time for a preliminary peck, young and old alike refuse them. There does not appear to be any mechanical difficulty in swallowing the hairy caterpillar, but it is difficult to connect the sense of taste with the hŏrny bill of a bird.

I timed the speed of locomotion in many of these larvæ, and upon a table covered with woollen cloth found it to be about three yards per minute. Why they are in such a hurry is puzzling, seeing that birds will not touch them, and their insect foes have no need to hunt them, as they feed openly, and are always to be had at dinner-time when wanted. There is a curious and, may I not say, singularly human aspect in the contrast between the hurrying caterpillar on the foot-way, and its stupid, gluttonous habit as soon as it finds its food. The activity of a lepidopterous insect seems to be often concentrated in one period of its existence: the agile soaring butterfly is developed from the most sluggish of larvæ; the torpid *Arctiæ* from very race-horses of caterpillars. The great excess of dipterous parasites is a noticeable fact, the proportion being as 82 to 1 hymenopterous.

I have often seen the large black *Tachina cæsia* to all appearance idly sunning itself on the nettles and docks where I found *Lubricipeda*, without a suspicion of its motives; and it is a useful lesson to learn from day to day how much is going on around us, before our very eyes, to many pheasants on the other side of the lake, which rather disturbed the ideas of liberty I had so long enjoyed, never meeting anyone. However, on looking up I saw notices on the trees:—"Trespassers, either nutting or otherwise, will be prosecuted." I soon ascertained there were gamekeepers and watchers, whose acquaintance I had not yet made.

Preston, February, 1878.

(To be continued.)

CONSIDERATIONS ON ABNORMAL GALL-GROWTH.

By E. A. Ormerod, F.M.S.

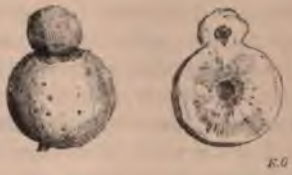

Fig. 1.—Cynips Kollari.

The cause of gall-growth, that is the exact method by which insect oviposition or larval presence causes this peculiar development, is still so far from having been ascertained that any completely abnormal form is of interest, as possibly throwing light on the physiological points involved; and the singular specimen figured above, showing one gall of *Cynips Kollari* formed on the apex of another, differs so completely from any known recorded state of this gall as to be worth notice. This, it will be seen, has no relation to the common double form of *Kollari* galls, in which two, starting growth in juxtaposition, unite by their contiguous sides, but consists of two galls of different dates of growth, and completely distinct (save at the origin of the super-imposed one) from each other. This interesting specimen was found growing near Maldon, by Mr. Fitch, who was good enough to forward it to me for examination.

When gathered the lower of the two galls was mature, hard, and brown, whilst the upper one (then as large as the older one from which it originated) was still young, green, and succulent; this difference in age being still further then disengaging itself by process of growth, a few fine shreds of tissue being noticeable drawn across the forming cavity, from the outside of the capsule to the inside of the containing hollow chamber, and then separated, this being completely effected in the case noted in about five days (from May 11th to May 16th).

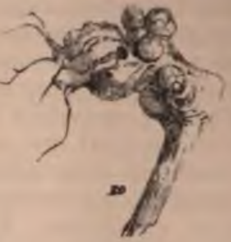

Fig. 2.—ANDRICUS CURVATOR.

Looking at *Cynips* galls of the oak (as most easily traceable) it appears that one species of *Cynips* causes one special kind of gall, whether the oviposition is on different parts of the tree, or whether several species deposit together in precisely coinciding position and circumstances. We see an example of the former in the well-known currant-gall, formed by *Spathegaster baccarum*, alike on flower-stalks and on leaves;* and of the latter in some of the bud- and bark-galls of the less-known species of *Aphilothrix*, where it appears plainly shown that it is oviposition, not the part of the tree attacked, that affects the characteristic of the gall. The cells of *Aphilothrix corticis* and *A. radicis* may be found in precisely similar circumstances in young bark; *Andricus quadrilineatus* with those at the base of the gall of *A. ramuli* (the woolly-gall); or again in the case of the artichoke-gall (*Aphilothrix gemmæ*), occurring in the axil of a leaf on a shoot bearing galls of *Cynips Kollari*, and similarly in the axils of the leaves immediately above and below; but with this, although the form of the gall (properly so-called) appears constant, yet there are modifications in what may be called the secondary part.

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* Even should the alternation of generation between *Spathegaster baccarum* and *Neuroterus lenticularis*, which Dr. Adler considers to take place, become a proved fact, this would in no way militate against the constant correspondence of the gall and its insect, as under this theory the change of one follows the change of the other.—E. A. O.

We see the two parts (of course only speaking of the species of galls where two parts exist) can carry on life each without the other, and that there is in some cases a chemical difference is shown by galls of *A. radicis* changing colour in the general mass when cut by a steel knife, whilst the section of the cells continues white. In the same species of gall we have the large cellular mass forcing itself rapidly up through the bark from the cambium region beneath, during the flow of sap in the spring, whilst the single-celled form placed in the substance of the young bark simply exists in the shape of detached specimens, this difference no way proving difference in the gall, as may be shown in the cells of the woolly-gall, where some exist single, some double, some in indivisible clusters. In the artichoke-gall we have frequently an abortive form, with the gall-chamber missing, in which the larval action appears to have been interrupted before the formation of the cell, so as only to have given rise to what is botanically an abortive shoot, with its longitudinal growth checked, but the adventitious buds thrown into action in the form of the stunted leaves which compose the scales.

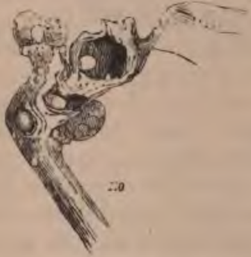

Fig. 3.—ANDRICUS INFLATOR.

In *Andricus inflator* we have the inner chamber containing the gall insect, with a clear illustration of simply modified vegetable action in the surrounding shortened shoot, giving rise to its numerous sprays; and in the specimen, whether we consider the two lower cells those of *A. inflator* or *A. curvator*, we have an example of the gall-chamber existing without its characteristic involucral development, whilst above is a specimen which, when fresh, must have been abnormally swollen even for *A. curvator*, and from which there appears no reason botanically why another gall should not have sprung. The leaf and petiole in the normal state are capable of throwing out shoots, and in this case there is no apparent change in the general parts of the structure, and if from abnormal stimulus a shoot was thrown out oviposition would give us an abnormal gall, coinciding in many points with the one under consideration of *Cynips Kollari*. However, though this is apparently possible, we have not sufficient knowledge of the structural alterations to admit its probability, and as the very essence of the characteristic of the *Kollari* gall is to lose all trace of its origin in its progress of growth, even should the case have been so, it must rest unproved.

The matter, however, is very interesting as a clue to variations of structure, and some experiments on the results of stimulating or condensing the flow of sap in the early stages of the growth of *Kollari* galls, by ringing, or heading back the shoots, might give us some valuable physiological information.

Judging from experiments with others of the *Cynipidæ*, abnormal oviposition might readily be effected. *Aphilothrix radicis* will oviposit in oak buds in captivity; and on the 13th of December, in the last year, I was fortunate enough to capture two specimens of *Biorhiza aptera* in the very act of ovipositing in the buds of the branches of an old oak at about seven feet from the ground. Being anxious to secure the insects for identification beyond my own examination, I was obliged to draw down the boughs and break off the sprays, but even this did not disturb them, so that in one case I was able to watch the operation for some minutes, and in the other (as I slightly injured the creature in gathering the spray) the ovipositor was just pressed from the bud, with an egg in the act of protrusion. One of the specimens subsequently (as far as could be seen through a fine net) proceeded with oviposition on two buds of an oak in my own garden; and as I have noted the then state of the spray, and isolated it, some curious results may be hoped for.

On examining the buds, amongst which I first found the *Biorhiza* ovipositing, I found one to contain a mass of eggs, similar in their peculiar shape (which is elongated at one end, to a somewhat flask or stalked form), to others which I have taken from the abdomen of *Cynipidæ* on previous occasions. These I have placed, with the bud-scales (which shield them still, though broken from the bud-base), in a small slit made in the bark below the ground level of the same oak in my garden. At present the outside of the bud is still fresh, and as the contents of the eggs showed indications of the larval presence more than a month ago, I hope that they have progressed so far as to give a prospect of some information as to the effects of larval action on the under-ground bark clearly distinct from those of oviposition.

Dunster Lodge, near Isleworth,
January 24, 1878.

DESCRIPTIONS OF OAK-GALLS.

Translated from Dr. G. L. MAYR's 'Die Mitteleuropäischen Eichengallen.'

By EDWARD A. FITCH.

(Continued from p. 33.)

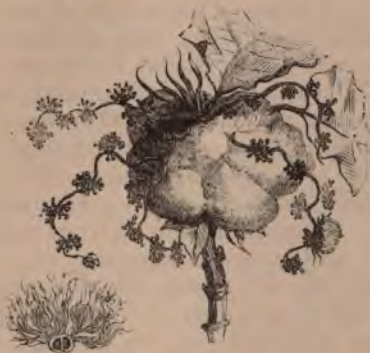

Fig. 81.—Galls of *Andricus ramuli*, and a double gall in section.

81. *Andricus ramuli*, Linné (= ***Teras amentorum***, Hart.).—This really small, but almost always compound, gall may be found in May on the catkins of ***Quercus pedunculata*** or ***Q. sessiliflora***, but particularly on ***Q. pubescens***. Attached to the catkins we often see nut-sized or smaller woolly masses, which have altogether the appearance of white or brownish yellow cotton-wool rolled together in a ball. If we unroll such a ball it falls into several smaller balls, each of which belongs to a single catkin flower. These smaller balls contain a hard uneven lump in the interior, which is about the size and shape of a millet-seed, hard and brown. Ten to twenty of these grow together on a deformed stalk. Each of these small galls is hard, contains a larva-cell, and is covered with numerous very long hairs, originally sappy, but soon drying: these are matted together and twisted in the same

way as the cotton-seed wool. We sometimes find on a fully developed catkin one or more flowers deformed into a small ball, a single gall surrounded with the hairs. In many cases I have bred *A. ramuli* from these; but last year from such galls, which occurred on *Quercus sessiliflora*, I bred in the third week of May a gall-fly which belonged to another species, and differed from it in having a black head and thorax: the abdomen brown above, yellow below; the antennæ yellow at the base, with the first half brown, and with yellow legs. But still further breeding is necessary in order to acquire more knowledge of it. The yellow gall-flies appear towards the end of May and beginning of June. —G. L. Mayr.

I have had more specimens of this "woolly" or "cotton" gall of the oak sent to me to name than of any other species. It is very widely distributed, and generally common in Britain. It has been recorded from five Scotch counties, the most northern of which are Aberdeen and Inverness-shire. From galls collected on 7th June (1875) the first, *A. ramuli*, emerged on the 24th June; and it continued to do so in abundance till the second week in July. The parasites bred by me were *Olynx gallarum*, L., in great abundance: these all emerged the last week in June. Later came two species of *Pteromalus*, and a few specimens of a small green *Callimome*, with the ovipositor slightly shorter than the body. These may be a variety of *C. auratus*, Fonsc., which is mentioned as a parasite of this species in Dr. Mayr's monograph. I also bred several *Dictyopteryx Lœflingiana* from these galls; and Mr. Walker mentions *Anthomyia* (*Homalomyia*) *canicularis* as a dweller in them. Mayr remarks on the scarcity of *Synergi*, and says he only bred three specimens of *S. facialis*, H., and nine of *S. radiatus*, Mayr, although he had hundreds of the galls. I can confirm this, as amongst my numerous stores I do not find a single *Ramuli*-bred *Synergus*. He also bred two specimens of *Ceroptres arator*, H., which emerged at the same time, *viz.*, June of the first year.—E. A. Fitch.

COLLECTED OBSERVATIONS ON BRITISH SAWFLIES.

By the late Edward Newman.

(Continued from p. 38.)

Proceed we now again to divide the *Hexapods* by metamorphosis and wing-character. Having once fully explained their true structure, in having shown that they are projected and everted wind-pipes, on which a flying membrane is spread, in the same manner as skin on the projected ribs of a flying dragon (*Draco volans*) or sail-cloth on the ribs of a windmill, it will be useless to attempt the substitution of any other term for that of wing.

The beings then of which this paper treats possess an exo-skeleton, or external skeleton, six legs, and either two, four, or six wings, which are subject to metamorphosis, and which arrive at perfection and maturity by one or other of the following methods:—

1. By passing through an amorphous state,—*Amorpha*,—in which the penultimate state (or pupa, or chrysalis) is provided with neither mouth nor organs of locomotion, consequently it neither eats nor moves, nor does it bear any resemblance to the perfect state. We find that the exo-skeleton, after it has been shed for the last time, exhibits some traces of the liberated imago, and that the various portions, or plaits, or cases, are easily separated, and often spontaneously dehised, the dehiscence taking place at perfectly natural fissures. Although the limbs, notwithstanding their change, and the divisions of the trunk are often thus obviously indicated on the exterior surface of the exo-skeleton, the penultimate cannot be said to bear any resemblance to the ultimate state. This class contains two subordinate classes or sub-classes, or as entomologists, with apparently great impropriety, often call them, "orders," a term which should be used, as it is in places, for associating those animals that possess similar natural characters, and have propensities in common: thus, the *Feræ* amongst sucklers, the *Accipitres* amongst birds, the *Carnivores* amongst *Coleoptera*, and *Mantides* amongst *Orthoptera*, are really natural orders, and precise equivalents one of the other; and each has an aquatic section, also equivalents of each other. This group, then, is divided into two minor groups by the number and clothing of the wings, thus—(A) *Lepidoptera*, in which the imago has four wings, all of them covered with scales. (B) *Diptera*, in which the imago has two wings only, and these are generally naked, but sometimes sparingly covered with hairs, or more or less seldom with scales: in *Diptera* there are also two poisers, which seem the representative of a second pair of wings, but this is only a matter of opinion; I am unable to prove them to be so; they possess, moreover, a pair of winglets, or lobes, one

at the base of each wing; the precise use of these winglets has occasioned some speculation, but this matter also I must leave in doubt. The penultimate or pupa state of *Diptera* is very different in different families; in some it somewhat resembles that of certain *Lepidoptera;* in others it is an oblong object, quite smooth, and looking as though it had been turned in a lathe.

2. By passing through a necromorphous state,—*Necromorpha*,—in which the penultimate state is provided with mouth and organs of locomotion, detached from the trunk throughout their length, but so swathed and enveloped in separate cases that it can employ neither. The resemblance, therefore, to the perfect insect is considerable, except in the want of locomotive power. This group contains two subordinate groups, principally by the character of the fore wings:—(C) *Hymenoptera*, in which the imago has usually four fully developed wings, which are membranous, naked, and without hairs or scales. (D) *Coleoptera*, in which the imago has two fully developed wings—the hind wings, and two wing-cases which cover the wings, and appear to take the place of fore wings: they are invariably called elytra. These are not needed in flying; they are gently raised, some a very little, others to an angle of 45°, and others even more still; but in all cases, when raised at all, they are sufficiently so to allow full play for the hind and only pair of membranous wings. Besides this power of just lifting the elytra, the insect seems entirely unable to move them, and the wings are never seen vibrating as in other insects; indeed they appear to want the systems of muscles necessary for vibration. This want, which is perhaps a most distinctive character of beetles, seems to have been overlooked by entomologists generally, although noticed by the late Mr. Dale in *Stylops*, which is a manifest *Coleopteron*.

3. By passing through an isomorphous state,—*Isomorpha*,—in which all the states are active and voracious, and of similar form to the imago, except in wing. The imago has four wings, all of them more or less coriaceous or leathery, and all more or less available for flight; the fore wings are not merely raised to allow free action of the hind wings, but even these share in the function of flight: this function is, however, scarcely performed with any energy, but is a sort of half-hearted performance, notwithstanding the wonderful migrations some of these insects perform. There are two subdivisions:—(E) *Orthoptera*, having powerful mandibles,

predominating on the front segments, the ochreous on the 9th to 13th segments. The head is also of these two colours, in about equal proportion. Dorsal line ochreous, deeply edged with smoke-colour; there is a distinct white spot on the posterior part of the 6th, 7th, and 8th segments. There are no perceptible subdorsal lines, but a conspicuous ochreous line extends through the region of the spiracles. The ventral surface is of the same dull, dark, smoky brown as the dorsal area, but has a very pretty series of large, ochreous, crescentic marks throughout its entire length, and there is a very faint indication of a pale central line; the hairs are black. This larva spun a slight cocoon of loose threads; and the imago, a fine female specimen, emerged August 4th.—G. T. Porritt; Highroyd House, Huddersfield; February 6, 1878.

Leucophasia sinapis at rest.—Had my dear friend, the late Edward Newman, ever mentioned to me that *Leucophasia sinapis* had never been observed at rest, as stated by Mr. Whittle in the 'Entomologist' for March (Entom. xi. 69), I should have given him the result of my experience of this species. When Pembury, near Tunbridge Wells, was visited by me every year for the purpose of collecting *Lepidoptera*, I have often seen the insect at rest, and many of the specimens in my cabinet were so captured. It was my practice to resort to the woods frequently at night, and by the artificial light of my lantern I found that *L. sinapis* was more easily seen at rest at that time than during the day. Its appearance was then conspicuous by the sides of the drives; and it invariably carried its wings closed over the back, as is the case with all the *Pieridæ* with which I am acquainted. I am inclined to think that the specimen seen by Mr. Whittle had but recently emerged from the chrysalis, and that its wings were limp.—J. Jenner Weir; 6, Haddo Villas, Blackheath, March 3, 1878.

Spring Captures, 1878.—While staying in Norfolk, at Lord Walsingham's, during the last week in February, I took a male specimen of *Nyssia hispidaria;* and also saw flying round the hall-lights *Hybernia leucophearia* and *H. progemmaria.* In Epping Forest *N. hispidaria*, *Phigalia pilosaria*, *Amphydasis prodromaria*, and *H. leucophearia.* In thistle-stems, in same locality, larvæ and pupæ of *Ephippiphora scutulana*, commonly. This is, I believe, the first time *N. hispidaria* has been recorded from Norfolk.—Thos. Eedle; 40, Goldsmith Row, Hackney Road, E., March, 1878.

Early appearance of Insects.—The effects of the mild winter we have just passed are now to be noticed in the unusually early appearance of some of our spring species of insects; and, should we not experience any very sharp frosts or a long continuance of east winds, entomologists may look forward to a season that promises to be a much more successful one than we have enjoyed of late years. On the 3rd of March I saw a very lively specimen of *Gonepteryx rhamni* in a garden at Wandsworth; and a single specimen of *Biston hirtaria* and *Hemerophila abruptaria* in a London Square this morning. These are the earliest dates at which I have ever observed these species. Last week a specimen of *Mamestra brassicæ* was brought to me, which had flown in through an open window: it was in fine order, and had evidently only recently emerged from the pupa.—Walter P. Weston; 1, Duncan Terrace, N., March 20, 1878.

Selenia illustraria.—I have already at this early period of the season bred six specimens of *Selenia illustraria*, one of which is a small female exceedingly rich in colour. This is unusually early, and possibly forebodes an exceptional season.—J. R. Wellman; 14, Portland Place North, Clapham Road, March 16, 1878.

Sericoris Doubledayana.—While collecting during the last week in July, 1877, on the banks of the River Bure, Norfolk, I found *Sericoris Doubledayana* not infrequently. This species may easily be overlooked, as it flies gently amongst marsh-fern (*Lastrea thelypteris*), bog-myrtle (*Myrica gale*), and reeds, in the late afternoon sunshine. It is necessary to separate the stems and actually look for the moths, so little do they rise above the under-growth. They were in beautiful condition at this date.—E. G. Meek; 56, Brompton Road, London, S.W.

Heusimene fimbriana.—A fine female of this species appeared in one of my cages on the 20th of February last, being the earliest date of appearance that has come under my notice.—W. Machin; 22, Argyle Road, Carlton Square, E., February 23, 1878.

Æchmia dentella and Ephippiphora nigricostana.—At the end of May, 1866, I beat from the flowers of the common elder four fine specimens of *Æchmia dentella;* and from the same hedge, at Plumstead, six specimens of *Ephippiphora nigricostana*, which had evidently but recently emerged from pupæ. I have since reared the latter species from the roots of *Stachys sylvatica*.—Id.

Silpha opaca, under carrion, abundant. *S. nigrita*, under carrion, abundant. *S. atrata*, under carrion, abundant. *Hister neglectus*, sweeping, abundant. *H. cadaverinus*, sweeping, abundant. *Aphodius fossor*, common, river bank. *Apion assimile*, common. *Chrysomela didymata*, common. *Telephorus discoidens*, foliage, common. *T. flavilabris*, foliage, common. *T. testaceus*, foliage, common. *T. bicolor*, foliage, common. *T. nigricans*, foliage, common. *Elater cinnabarinus*, under stone, scarce. *Phyllobius oblongus*, common. *P. uniformis*, common. *Necrobia rufipes*, common. *Catops tristis*, common.—THOMAS BRUNTON; Glenarm Castle, Larne, North of Ireland, January, 18, 1878.

AROMIA MOSCHATA.—I have just noticed the capture of *Aromia moschata*, in Dumfriesshire, mentioned in the December 'Entomologist' (Entom. x. 304). Although this is the first instance I have heard of the perfect insect in Scotland, I may mention that, in the July number of the 'Scottish Naturalist' for 1875, I notified the capture, in Haddingtonshire, of the larvæ of the above-mentioned insect.—A. BUCHAN-HEPBURN; Junior Carlton Club, February 1, 1878.

RANATRA LINEARIS ATTACKING CARP EGGS.—In the last session of the Naturforschende Gesellschaft of Görlitz, the President, Dr. Peck, made an interesting communication on a newly-discovered enemy of the carp. It appears that large numbers of the spawn of this fish are attacked by the water-bug (*Ranatra linearis*), which fastens itself firmly on the back of its prey with its fore feet, and by means of its sharply-pointed trunk sucks out the small amount of blood in the young organism. A series of experiments, conducted in some large establishments for fish culture, show that the only method of fighting this new foe is to drain the ponds dry and re-stock them with fish.—'NATURE.'

FAILURE OF TRIFOLIUM INCARNATUM.—It is well known that *Trifolium incarnatum* soon after its appearance above ground suddenly disappears. In common with many others I have been at a loss to account for this. It was explained by a friend of mine drawing my attention to a small brown insect, something like a beetle, about a quarter of an inch long, which found a refuge in the top joint of the stubble, on which the seed is usually drilled without being moved by the plough. I sent some specimens to Mr. Murray, who for some years has devoted his attention to destructive insects, and whose death I was sorry to see recorded. Mr. Murray pronounced the insect to be of a destructive nature to pea and other crops. This season we slightly skimmed the stubble, and got rid of the wheat-stalks as well as we could. The plant on land so treated has not failed, though near at hand that drilled on the unmoved stubble has failed, in which cases I found the insect in its place of refuge, the first joint of the straw left as stubble. This may be known to others, though new to me.—J. C. CLUTTERBUCK.

[This little insect depredator was probably *Sitones*, which is so fond of hiding in the stubble. The whole proceedings are altogether confirmatory of my remarks (Entom. x. 213). E. A. F.]

NATIONAL ENTOMOLOGICAL EXHIBITION.—This Exhibition was held at the Royal Aquarium, Westminster, March 9th to 23rd, and was highly successful. It has been found impossible to furnish an adequate report this month, but an interesting paper will appear in the May number.—ED.

REVIEW.

Illustrations of Varieties of British Lepidoptera. By S. L. MOSLEY. Part I. Huddersfield, 1878.

Mr. Mosley deserves every credit for the manner in which he has brought out the first part of this curious series. It requires much confidence on the part of an author now-a-days to issue a book consisting principally of plates, all coloured by his own hand. In this first number are six plates, representing the genera *Colias, Smerinthus, Callimorpha, Chelonia, Liparis,* and *Abraxas.* The best figures are those of *Colias Edusa* and *Abraxas grossulariata.* In colouring his plates Mr. Mosley has been generally successful; but we would suggest that the letterpress descriptions might with advantage be extended, especially with regard to localities of capture, and any circumstances likely to lead to our ascertaining the causes of these sports of Nature. We suppose there is some difficulty in obtaining subjects for this work, for several have already been recently figured, and others are not so exceptional as we might expect; but this improvement in choice will increase as the work becomes better known. Altogether the author may be congratulated on his effort in the cause of Science. He sets a good example to the many who will look over his book with more than passing interest.

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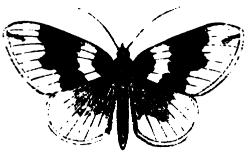
VARIETY OF CIDARIA SUFFUMATA.

By John T. Carrington.



Cidaria suffumata (variety).

The very beautiful example, an extraordinary variety, of *Cidaria suffumata*, from which the accompanying figure is drawn, is kindly lent by Mr. Geo. T. Porritt, of Huddersfield. It was captured at Almondbury, near Huddersfield, where it was disturbed from amongst underwood, in May, 1871. The carefully-drawn figure, given above, renders unnecessary any description of the very marked variation from the type of *C. suffumata* in this specimen. It may be well to remind our readers that, excepting in the well-known unicolorous form (*Piceata*), this species is not usually prone to variation.

FIRST NATIONAL ENTOMOLOGICAL EXHIBITION.

This Exhibition was held at the Royal Aquarium, Westminster, from the 9th to the 23rd of March, and attracted the attention of numerous entomologists, besides being of considerable interest to the general public.

The following gentlemen accepted the invitation of the Royal Aquarium Society to act on the Committee:—Sir Sidney Smith Saunders, C.M.G. (chairman); J. Jenner Weir, F.L.S. (vice-chairman); Sir Thomas Moncreiffe, Bart.; G. W. Bird; Edwin Birchall, F.L.S.; Fredk. Bond, F.L.S.;

J. B. Bridgman; S. J. Capper; John T. Carrington; Rev. H. Harpur Crewe, M.A.; Rev. T. W. Daltry, M.A.; Thomas Eedle; G. Elisha; E. A. Fitch; Battershell Gill, M.D., F.R.C.S.; H. Goss, F.L.S.; Rev. Joseph Greene, M.A.; Noah Greening; C. S. Gregson; W. L. Horley; W. F. Kirby; W. H. Lowe, M.D., F.R.C.P.; Rev. O. P. Cambridge, M.A.; G. T. Porritt, F.L.S.; J. A. Power, M.A., M.D.; W. Prest; J. G. Ross; Frederick Smith; Samuel Stevens, F.L.S.; Howard Vaughan; J. R. Wellman; W. P. Weston; and F. Buchanan White, M.D., F.L.S. Most of the London Entomological and Microscopical Societies sent delegates to discuss the necessary preliminaries. Mr. A. B. Farn gave his services as Secretary; and a sub-Committee was afterwards elected by the general Committee, consisting of Messrs. Carrington, Farn, Meek, Vaughan, Jenner Weir, Wellman, and Weston, upon whom fell the task of compiling the Catalogue, the assortment of the cases exhibited, and the whole of the general arrangements. The management of the Exhibition, after the opening, was carried out by Mr. Carrington.

All orders of insects were well represented; and the invitation to exhibit was most cordially responded to by numerous entomologists from all parts of the country, many of whom sent the whole of, and others very extensive selections from, their cabinets.

In the *Coleoptera* were the complete collections of Dr. Power, and of the late T. Wilkinson, of Scarborough, exhibited by Mr. E. G. Meek; and the *Curculionidæ* of Mr. S. Stevens. Mr. G. C. Champion also sent the greater part of his collection, which certainly bears away the palm for its beauty of arrangement. Amongst his numerous rarities were especially noticeable two out of the four known specimens of *Amara alpina*; a series of *Harpalus 4-punctatus*; single specimens (unique as British) of *Leptusa testacea*, *Aleochara hybernica*, *Cardiophorus rufipes*, *Homalota egregia*, and *H. rufotestacea*; three examples of the rare *Emus hirtus*; two *Compsochilus palpalis*; and specimens of the two rarest species of *Aphodius*—*A. scrofa* and *A. consputus*. There were also examples of *Phosphænus hemipterus*, *Anthicus bimaculatus*, a series of *Lymnexylon navale*, and an almost perfect collection of *Anisotomidæ*, including two out of the three known specimens of *Anisotoma pallens*, and fine series of *Agaricophagus* and *Colenis*.

the rarer species may be named *Prosopis cornuta* and *P. variegata; Andrena Haltorfiana, A. ferox, A. mouffetella,* and *A. polita*; *Halictus sexcinctus, Macropis labiata;* the unique specimen of *Rophites quinquespinosus*, captured last year at Guestling, near Hastings; *Nomada Bridgmaniana, N. armata, N. baccata,* and *N. Roberjeotiana; Osmia parietina, Heriades truncorum,* and *Megachile pyrina.* There was also a remarkable hermaphrodite of *Anthophora acervorum*, having the left side male, with the intermediate leg elongated and fringed, whilst the opposite leg was of the ordinary female type; as well as hermaphrodite examples of *Andrena nitida, Nomada baccata,* and *Apis mellifica.* The humble-bees contained a splendid series of *Bombus Smithianus*, and four examples of *B. pomorum*, not in other British collections. The *Formicidæ* contained every known species found in this country. The drawers of fossorial *Hymenoptera* were full of rare species, especially *Methoca ichneumonoides, Pompilus sericatus* and *P. notatus, Ceropiles variegata, Aporus unicolor* and *A. femorata, Miscophus bicolor* and *M. maritimus;* also *Artata stigma.* Among the *Vespidæ* were a fine series of the very local *Eumenes coarctata;* and of *Odynerus lævipes* and *Vespa arborea*, both being first discovered by Mr. Smith. The tongues of the genera of bees accompanied the insects; exhibiting in a very instructive manner the gradual development of that organ, from the short, blunt, wasp-like tongue of the genus *Colletes*, to the elongate form found in the groups *Anthophora* and *Bombus.*

Sir Sidney S. Saunders lent a collection of Grecian *Hymenoptera*, with their galleries and cells formed in the stems of various briars, as well as their parasites and larvæ. Amongst them were specimens of *Osmia tridentata, Megachile centiuncularis,* and the beautiful blue-black *Xylocopa cyanescens;* a fine series of the narrow-bodied *Raphioglossa eumenoides;* and *Psiliglossa odyneroides*, in which the sexes are remarkably distinct.

Amongst the remaining insects in this group were two drawers of aculeate *Hymenoptera*, sent by Mr. Goodman; and some British *Hymenoptera*, by Mr. Mapleston.

As might be expected, from the large number of entomologists who devote their attention to the British *Lepidoptera*, the cases containing insects of this group were very numerous, and included selections from nearly every large collection.

The *Diurni* of Mr. S. Stevens were very fine, and exceedingly rich in varieties, containing, amongst many others, a very fine hermaphrodite *Colias Edusa;* two varieties of *Vanessa Cardui*, similar to the figure in Newman's 'British Butterflies,' one of them being very large and brightly coloured. There were also black varieties of *Limenitis Sibylla;* some extraordinary *Satyrus Janira*, in which the ground colour is entirely blanched, and others with a large colourless patch in each wing; a white variety of *S. Tithonus;* a magnificent row of fourteen *Polyommatus dispar;* some dusky and white examples of *P. Phlæas;* an hermaphrodite *Lycæna Alexis*, having the wings on the left side female, and on the right side male; other varieties of *L. Alexis*, *L. Adonis*, *Syrichthus alveolus* var. *Lavateræ*, and some bone-coloured *Hesperia linea*.

Mr. P. H. Harper, F.R.C.S., exhibited a case showing the remarkable extent to which *Colias Edusa* is prone to vary, including every gradation from the typical *Edusa* to the whitest-coloured examples of the variety *Helice*, and most of them captured during the past year.

In the drawers shown by Mr. G. W. Bird were a fine series of *Apatura Iris* and its larvæ, from Kent; and a splendid row of *Vanessa Antiopa*, five of which were captured in Norfolk, three in Yorkshire, and one each in Leicestershire and Essex.

Mr. C. A. Briggs showed a remarkable collection of varieties of the genus *Lycæna*, including one hermaphrodite *L. Ægon*, having the wings on the right side male, and on the left female; also numerous varieties of *L. alexis*, and two hermaphrodites, both having the wings on the left side male, and on the right female; a remarkable series of varieties of both upper and under sides of *L. adonis*, including two females, having streaks of the male colouring; and *L. corydon*, with the distinct blue and brown forms of the female.

Among the other specialities were an entirely black variety of *Arge galathea*, belonging to Mr. Farn; and two varieties of *Colias Edusa*, from the collection of Mr. W. P. Weston, the one having the wings on the right side the variety *Helice*, and on the left the typical *Edusa;* and the other with the anterior wings *Helice*, and the posterior wings *Edusa*.

The Rev. Windsor Hambrough exhibited a drawer of rarities, including hermaphrodite *Colias Edusa ;* a remarkable variety of *Vanessa urticæ*, in which the usual black markings were concentrated into four confluent blotches; varieties of *Lycæna Corydon* and *L. agestis;* and the specimen of now in the possession of St. Bartholomew's Hospital. Mr. W. H. Thornthwaite exhibited specimens of *Heliothis scutosa* and *Noctua flammatra*: *Luperina Dumerili* and *Margarodes unionalis* from Devonshire, in 1877. All the above, except *L. Dumerili*, were, it is stated, taken at light.

Mr. Prest, on behalf of the Yorkshire Naturalists' Society, brought up a very complete collection, including one *Pieris Daplidice*; four *Vanessa Antiopa*, from Yorkshire; six *Lycæna Acis*, taken at Cardiff in 1877; two *Deilephila Euphorbiæ*; one *D. lineata*: a series of *D. Galii*; three *Chærocampa celerio*, two of which were taken in Yorkshire, and the other in Berwickshire; a *Lasiocampa ilicifolia*, from near Ripon; local forms of *Hepialus velleda*; some streaky varieties of *Arctia lubricipeda*; an hermaphrodite *Epione vespertaria*; single specimens of *Eupithecia extensaria* (Yorkshire, 1873) and *Eubolia mæniata* (Yorkshire, 1872); some remarkable melanic varieties of *Eupithecia albipunctata*; specimens of *Platypteryx sicula*, *Dicranura bicuspis*, *Acronycta alni*, *Xylina conformis*, and many other rarities. Also a web, spun by the larvæ of *Ephestia elutella*, nearly eight feet long and four feet wide, found on the walls of a chicory warehouse in York, and described in a former number of the 'Entomologist.' It may be added that when twisted into a rope-like form this web had supported a weight of fifty-six pounds.

Mr. E. G. Meek exhibited two drawers of insects from the south-west coast of Ireland, containing amongst others a series of *Procris statices*, of which it was remarkable that both sexes were the same size; also a selection of *Lepidoptera* from Scotland, including a long series of *Noctua sobrina*, *N. neglecta*, *Pachnobia hyperborea*, *Hadena glauca*, *Tæniocampa gothicina*, and *Anarta melanopa*; and a drawer containing *Crambus uliginosellus* and *Schœnobius gigantellus*, and other insects from the Norfolk fens.

Amongst the other numerous *Macro-Lepidoptera* were the exhibits of Mr. J. Bryant, containing a remarkable variety of *Lasiocampa quercifolia*: of Mr. W. Harper, containing *Argynnis Lathonia*, taken at Darenth Wood in 1868, and specimens of *Deilephila Galii*, *Cymatophora ocularis*, *Agrotis Ashworthii*, and *Plusia orichalcea*; and of Mr. F. Bartlett, with a pale variety of *Liparis dispar*, *Cymatophora diluta* and variety, *Leucania albipuncta*, *Triphæna subsequa*; and the specimen of *Euperia fulvago* taken in Highgate Wood in 1870.

their natural surroundings. I noticed this disposition especially in *Catocala nupta* and *Biston hirtaria*, two larvæ which, in the newer squares of western London, occur together, and are occasionally found side by side on the trunks of various species of poplar, willow, &c. On the 14th of June I found six larvæ of *C. nupta* on a small bough of willow: they were a little over a quarter of an inch in length, of a pale brown colour, with no perceptible markings. These I put into a glass pan with their food and some old flannel, as I had before noticed their fancy for resting on damp pieces, which at one time I had wound round the stalks of their food to keep it fresh: they are fond of lying close against it, clasping it with all their legs, of which the first two pairs are conspicuous from their length, whilst the rest are partly hidden by the curious fringe above them; they hide themselves in a fold of the flannel when about to moult. These six larvæ never gained in colour; their markings were scarcely to be traced; they remained very little darker than the flannel during the whole of this stage of their existence.

After I had had these larvæ a short time I found another on the same bough, quite different in appearance and character. It was very dark, mottled with gray and black; the cilia more conspicuous, probably owing to the dirt it had collected in crawling about the bough. This larva had recently moulted. I put it in with the others; and when in time it went down into the flannel to change its skin I watched for its reappearance with interest, wondering whether confinement would modify the colour. Its new coat was several shades paler than the skin it had cast; and by the time it was full fed its colour was exactly similar to the others.

In the early part of July I found several nearly full-fed larvæ on the trunks of trees—willow, Lombardy poplar, and one on balsam poplar (possibly this last larva may have crawled from a neighbouring willow, as it never touched the leaves of balsam poplar with which it was supplied, preferring the same fare as its companions). These larvæ were close against the tree, in little hollows in the bark; when touched they turned fiercely round, swinging their heads from side to side, intimating very clearly that they had a strong objection to being touched, and that they meant to do battle for their liberty. When I had got them safely off they continued to wriggle, trying to start from my hand, as if they had some dim consciousness of their future powers of flight. These, scores of bushes, only to dislodge an odd one now and then, and these were no sooner in the umbrella than they were blown out again. However, by "pegging" at it, I found odd bushes in sheltered corners that yielded as many as I cared for. The same occurred with *Macrochila marginella* the worst, scrubbiest bushes yielded most. Nothing else turned out, only odd *Zelleria hepariella;* and on the grass beneath, a little white speck now and then was seen; these were the little delicate *Elachista triseriatella* at rest, a perfect little ermine (*Yponomeuta*) in the markings and general appearance.

I now paid a visit to our marshes for *Crambus contaminellus*, from the last week in July to end of the first week in August, and only got twenty-eight specimens—about one evening's work. There was one remarkable circumstance some years since: every veneer I took was *C. contaminellus;* now the same place yields twenty of the common *C. tristellus* to one of the former. The *Crambidæ* begin to fly about nine o'clock in the evening most freely, and long after dark, in the bare marshes. One seldom gets a calm night. I had one only, and then I met with twenty-four specimens of an *Elachista*(?), which I think will want a name. It is identical with specimens I took at Howth, and near Fleetwood, some years ago. I hope to breed it, as I have now the larvæ feeding. The same night a light *Tortrix* flew past me; it was too dark to see what it was, but I felt pretty sure it was *Eupœcilia manniana.* I was anxious to settle when I got home whether I had the prize or not: however it turned up a pretty fair male *E. manniana.* This was quite five weeks late.

I found moths scarce everywhere, so I set off to Arnside, a nice little village on the opposite side of Morecambe Bay to Grange, a place in which I had never collected, to enjoy myself and prospect about, and be for once a prospective idler, so that when good moth times come again I should know the country. I mounted the hill behind the village and hit a yew tree, and out flew *Eupithecia sobrinata,* I might say by the dozen; they were so abundant that I ceased to hit either the yews or the juniper; they were such a pest, quite a contrast to the opposite, Witherslack, side. The sun came out; and here was flying freely *Amphysa gerningana,* and *Peronea aspersana* in profusion. I had my net in my pocket (never without), and a few scores of boxes that were soon filled. A couple of days later I went well stocked with both big and little boxes, as I saw *Erebia Blandina* were stretching themselves, quite limp and in such splendid order that I could not help taking a nice series: one, with a pale yellow patch instead of the brown in the upper wing. Now comes a clap of thunder; all goes dark around, and I had to begin to look for a place of shelter. A heavy shower; and then all is quite calm. Now the moths are all alive, and so am I. Whilst sheltering I was watching among some *Rosa spinosissima*, expecting *Spilonota amœnana* to turn up. I was soon amongst them, and boxed about a score. The day still keeping dark I found an old crab tree, I may say, full of *Argyresthia andereggiella;* I boxed eighty, as quickly as I could keep at work, they were so easily seen on a dark day; but when the sun is bright you cannot see this silvery species at all. Next I gave a thump at a young oak: a moth darts out to the ground. I follow it, thinking it is a flight that I had not seen for years: there it was—a splendid male *Stilbia anomala*. It seemed to know I was looking at it: up it got, and made a dart over a stone wall; but my net secured it. I saw another, but lost it. *Larentia olivata* was in abundance, but worn.

Another visit, about the 12th, I went to look for *Lycæna corydon*—to see it alive; but no luck. It used to abound along with the *Erebia Blandina*, but none have been seen for years, I am informed. However, I took *Ephippiphora signatana*, *Cleodora cytisella*, and *Gelechia rhombella;* the two latter first time in the north. *Elachista adscitella* was in abundance. Altogether Arnside seemed to be the best place for numbers that I had been at.

Last year, a week later, when it was blowing a gale, Mr. Threlfall and I found several *Yponomeuta plumbella* sheltering beneath a spindle tree; and on the top of Arnside Knot, in a fir wood, some very fine dark *Plutella cruciferella*, a queer place for a turnip feeder. By the way, a young friend of mine took twelve *Argynnis Adippe* and one *Thecla betulæ* one day, at Arnside.

The junipers in this district grow to twelve feet high, and are capital shelter for moths. There were plenty of *Argyresthia aurulentella* and some *Coriscium cuculipennella*. The fine fir woods, also, will no doubt yield well with a good season.

(To be continued.)

DESCRIPTIONS OF OAK-GALLS.

Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen.'

By Edward A. Fitch.

(Continued from p. 88.)

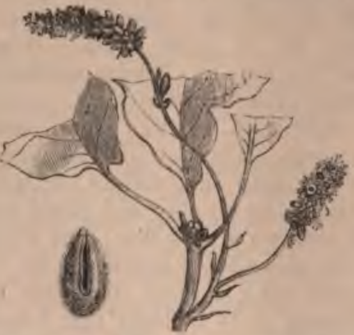


Fig. 82.—Galls of *Andricus amenti*: natural size and magnified.

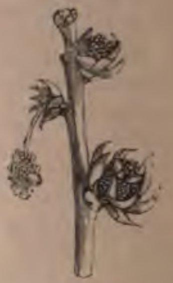


Fig. 83.—Galls of *A. occultus*.

82. *Andricus amenti*, Gir.—The small, inconspicuous gall may be found about the middle of May, attached to a male flower of *Quercus sessiliflora* or *Q. pubescens*. It is oviform, sharply rounded at the base, somewhat elongate, and bluntly-pointed at the unattached end. It is at the most 2 millimetres long and 1 millimetre thick. At first greenish, then brownish in colour, and tolerably thickly covered with bristly, simple and short, yellow hairs. It is not succulent, thin-walled, and contains a large larval chamber without an inner gall. Dr. Giraud's opinion, that this gall is developed from a stamen, admits of no doubt, as we often find the altered portions of the anther, sometimes peculiarly formed (for instance, in the shape of two slight swellings divided by a furrow), on the side of the upper half of the gall; so that, therefore, the stamen with the connective is changed into the gall. The gall appears singly or in great numbers on a catkin with the male flowers: at the fall of the bloom these catkins are generally fresh, and often somewhat thickened; the stalk is also not uncommonly bent at the spot where the galls occur. The yellow gall-flies bite themselves out, through the rind of the gall, during the latter half of May or beginning of June; while the galls themselves, often together with the stalk, remain on the tree the whole summer.—G. L. Mayr.

This little catkin-gall, which from its size would readily escape observation, has already been recorded as British. Dr. Giraud obtained the gall-flies by thousands from the 16th to the 24th of May, but I find no mention of any parasites.—E. A. FITCH.

83. *Andricus occultus*, Tschek. (Verh. zool. bot. Ges., 1871, p. 797).—In the latter half of May, when the staminiferous catkins of *Quercus pubescens* are generally fully developed, we may sometimes find some which are still undeveloped. This catkin bloom, on account of the non-development of the flower-stalk, becomes spherical, and is more or less surrounded, at the base as well as at the sides, by the divided but crowded bud-scales. If we now remove a portion of the anthers and perianth, so that the flower-stalk is laid bare, we shall see one to three reddish brown galls, of about the size of a millet-seed, in the middle of the catkin, generally on the top of the slightly-thickened stalk, which is only from 2 to 2·5 millimetres long. When the flower-bud produces more than one catkin, either each of them contains one or two galls, or the one producing galls remains spherical, whilst the others become fully developed. The gall itself is very like that of *Andricus amenti*. It is 2 to 2·5 millimetres long, oviform, pointed at the upper end as well as at the base, reddish brown; at the base it is smooth, or covered with small, extremely short, stiff bristles, whilst on the upper half it is thickly covered quite to the apex with long, rather soft, red-brown and yellow hairs. Perianth leaves may often be found springing from the gall, but I can detect no anthers. The periphery of the gall, like that of *A. amenti*, is thin, and encloses the larva chamber, or inner gall. The gall-fly leaves the gall in May, during the blooming time.—G. L. MAYR.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

VANESSA ANTIOPA IN SURREY.—A friend of mine, Mr. Bodkin, who is an artist in this neighbourhood, has to-day brought me a remarkably fine specimen of *Vanessa Antiopa*, which he caught, on April 5th, in a wood about four miles from this village. It is very perfect, and none the worse for its winter hibernation.—E. CAPRON; Shere, near Guildford, April 16, 1878.

COLIAS EDUSA IN APRIL.—On April 18th, this year, I saw net or box with me, and the insect was in consequence considerably damaged. The moment of capture I thought it was *H. peltigera*, but found out it was not when I got home, having that insect in my cabinet. The specimen has since been identified as *Heliothis armigera*.—V. R. PERKINS; 54, Gloucester Street, Pimlico, April 4, 1878.

A RUN TO EPPING FOREST.—On Easter Monday I went down to Chingford, where I arrived about 12 a.m. I walked over to Fair Meed Bottom, which I found terribly wet from the effects of the late heavy rains. The weather, however, being warm, I put up my net, and went to work tapping the bushes for *Micro-Lepidoptera.* I took a fine series of *Perittia obscuripunctella* and *Chrysocoris festaliella;* and from the numerous *Elachista pollinariella*, which I disturbed, I secured one beautiful female. I also met with the following:—*Swammerdamia comptella* and *S. pyrella*, *Incurvaria masculella*, *Lithocolletis corylifoliella*, and one or two other *Lithocolletis* which I have not yet examined. A fair specimen of *Anticlea derivata* flew out; and a female *Aleucis pictaria*, which I have retained in the hope of getting eggs. —WILLIAM MACHIN; 22, Argyle Road, Carlton Square, E., April 25, 1878.

BOTYS TERREALIS BRED.—On March 4th I went into my breeding-room,—a very cold one, with seldom any sun; judge of my surprise at seeing a fine *B. terrealis* at rest on the window. At the same time I saw the larva crawling about in my flower-pots: I fancy it is one that should have come out last July. Finding this led me to look in my jars and other breeding apparatus, when I saw *Eupithecia pumilata* had ventured out also.—J. B. HODGKINSON; 15, Spring Bank, Preston, April 1, 1878.

INTOXICATED INSECTS.—During the fine and glorious evenings which we experienced in July, 1876, I was somewhat amused by the nocturnal visits of a certain *Tryphæna pronuba.* While collecting at sugar in the early part of the month, a friend called my attention to this peculiar but ragged individual, which was fully enjoying our sweets. In due course he became intoxicated, and had to give way to the obvious result; but naturalists tell us that alcohol acts upon the lower forms of animal life exactly in the same way as it does upon man. Now if we admit this, then we have a right to believe that its excessive use will tend to shorten an insect's life: whether it was so with this *pronuba* is a question that puzzles me, as for more than three weeks this dissipated character took every opportunity of using our sugar, and there we found him five or six times a week as drunk as usual. However, I am inclined to think that the alcoholic mixture nourished him, so much so that he lived to a longer period than the usual term; and probably his career was then cut short simply by the ravages of some insectivorous creature.—H. T. Dobson, jun.; New Malden, Surrey.

[We remember trying sugar every suitable night through a mild winter, and seeing a certain specimen of *Cerastis vaccinii*, which we had marked, at the sugared tree on upwards of fifty occasions, and only lost sight of it about the middle of April.—Ed.]

Green Hairy Larvæ.—At the February meeting of the Entomological Society Sir John Lubbock is reported to have read a paper "On the Colouring of British Caterpillars," in which he stated that no hairy caterpillars are green. Now I think this is trying to prove too much. A not uncommon variety of the larva of *Acronycta leporina* is a beautiful pale green, covered with rather long, soft white hair. Again, I suppose Sir John would call the caterpillar of the emperor moth, *Saturnia pavonia-minor*, a hairy caterpillar: this, when full grown, is always some shade of green. At the same meeting Sir John stated that the bright coloration and hirsute jacket of hairy larvæ acted as a warning that the species was inedible. How is it, then, that the cuckoo seems to prefer hairy and bright-coloured larvæ to smooth ones? Last autumn, when staying at Tresco Abbey, in the Scilly Isles, I was informed that a few years since a bee-eater, *Merops apiaster*, visited the islands in the autumn, and remained for some time. Its principal food was the larva of the fox-moth, *Lasiocampa rubi*, one of the hairiest of hairy larvæ. It was frequently seen to seize the larvæ, beat them to death against the ground, as a thrush does a worm, and then swallow them whole.—[Rev.] H. Harpur Crewe; Drayton-Beauchamp Rectory, Tring, April 5, 1878.

Note on Dr. Power's List of the Additions to the British Coleoptera during the Years 1872—77 inclusive. — In Dr. Power's list of the new species of British Coleoptera added to the list from 1872 to 1877 inclusive (Entom. xi. 62), no mention is made of several species that I think ought to find a place therein. It is true three of these (*Homalium testaceum*, *Psammodius porcicollis*, and *Thyamis ferruginea*) have already been on our lists, but either erroneously determined or of more than doubtful British origin, and are noticed as such by Mr. E. C. Rye in Entom. Annual for 1872, and for the same reason are not included in Dr. Sharp's 'Catalogue.' The following seven species are not mentioned in Dr. Power's list:—

1. *Homalium testaceum*, Er.—E. C. Rye, Ent. An., 1873, 83. R. E. Bull. London district.

2. *Trichopteryx seminitens*, Matth.—A. Matthews, Ent. Mo. Mag. xiv., 36.: described.

3. *Ptilium marginatum*, Aubé.—A. Matthews, Ent. Mo. Mag. xiv., 36. Cambridge and Norfolk fens.

4. *Anisotoma pallens*, Sturm.—E. C. Rye, Ent. Mo. Mag. x., 135; Ent. An., 1874, 86. J. J. Walker, Deal; three examples, Sept. 19, 1873.

5. *Psammodius porcicollis*, Illig.—J. J. Walker, Ent. Mo. Mag. xii., 62 & 108. Whitsand Bay, Cornwall; several examples.

6. *Apion Ryei*, Black.—T. Blackburn, Ent. Mo. Mag. xi. 128: described. Shetland Isles, July, 1874.

7. *Thyamis ferruginea*, Foud.—E. C. Rye, Ent. Mo. Mag. xii., 180. E. C. Rye and G. C. Champion. (One example, Caterham, July, 1873).

Dr. Power remarks of *Tribolium confusum*, Duv., "no doubt introduced." No one will probably dispute this; still the remark would apply equally well to *T. ferrugineum*, Fab. The two species are about equally common in collections, and are often found in company. *Scopæus subcylindricus*, Scribe, can at present hardly be numbered among British species, like some others (*Apion scrobicolle*, Gyll., *Magdalinus Heydeni*, Desb., and *Ceuthorhynchideus Crotchi*, Bris.), ascribed to Britain by continental entomologists. It requires "further verification." Additional localities for the following species, included in Dr. Power's list, seem worthy of note:—*Harpalus 4-punctatus*, Dej., Aviemore, Inverness-shire; *Anisotoma macropus*, Rye, Tilgate; *Liosomus troglodytes*, Rye, Chatham (J. J. Walker); *Nanophyes gracilis*, Redt., Tilgate, in profusion, August, 1875; and *Orchestes semirufus*, Gyll., Woking, not rare on wild cherry. —G. C. CHAMPION; 274, Walworth Road, London, April 9, 1878.

RANATRA LINEARIS.—In the April number (Entom. xi. 95) this water-bug is mentioned as having been found very injurious to carp-spawn. It may be of some interest to mention that a specimen accidentally introduced into an aquarium, in water procured from a pool not far from Isleworth (I rather think from Wandsworth) did much harm to the small English fishes confined with it, but had left the gold-fish (up to the time when I examined them) entirely free from attack. I have not myself seen the *Ranatra* in the act of preying on its victim; but the owner of the aquarium, who is a careful observer, informed me that it selected any point indifferently, simply digging its rostrum well in, and holding firmly with its legs, for which the long, curved, though clawless tibiæ and tarsi of the first pair are especially adapted. — E. A. ORMEROD; Dunster Lodge, near Isleworth, April 13, 1878.

BOOKS ON BRITISH HYMENOPTERA.—In reply to Mr. W. Gardiner, who asks for information on this head, if he thinks of studying the entire order of *Hymenoptera* he would require quite a small library. In Westwood's Introduction he is referred to all the standard works. If he intends to imply the *Aculeata*, Shuckard is good as regards generic description, &c.; but his descriptions are of generic distinctions, and are elaborated with mere specific differences. Of specific descriptions there are none. Therefore Mr. Gardiner wants the last edition of 'British Bees,' by Mr. Frederick Smith; and also the 'Catalogue of British Fossorial Hymenoptera—*Formicidæ* and *Vespidæ*,' published by the Trustees of the British Museum in 1858; also by Mr. Smith. For the *Ichneumonidæ*, Gravenhorst's 'Ichneumonidæ Europeæ;' there is no work of the kind in English. The gall-flies he will find in the 'Entomologist;' there is no separate work complete in English.—ED.

CAMBRIDGE ENTOMOLOGICAL SOCIETY.—This Society held its twenty-sixth Annual Meeting on February 8th, 1878, when the officers were elected for the coming year, and the Treasurer presented his statement of accounts, which showed a substantial balance in the Society's favour. The number and destination of the excursions, which ought to be of a most interesting character, considering the localities chosen, was arranged. Mr. W. A. Forbes, of St. John's, Cambridge, the Honorary Secretary, requests us to notice this Society, with the object of its becoming better known. We have great pleasure in doing so, and at the same time wish its already long career and success may be extended for many years.—ED.

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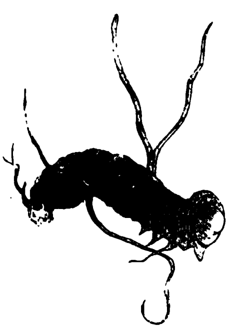
NOTES ON CERTAIN PARASITIC FUNGI WHICH ATTACK INSECTS.

By F. Buchanan White, M.D., F.L.S.



Mamestra brassicæ.

I recently received (through Mr. Carrington) from Mr. H. Sharp, of 16, Huntsworth Terrace, Portman Market, a sketch of a dead larva attacked by a parasitic fungus. In his letter he says that while examining a fern case, last autumn, he found the larva of *Mamestra brassicæ* with fungus attached, of which a figure is given above.

Mr. Sharp's fungus is the conidiiferous condition of a species of *Torrubia*, a genus of fungi of which most of the species are parasitic upon insects. The order Lepidoptera is not the only one attacked by species of this genus, for there are records of at least four other orders, *viz.* Coleoptera, Orthoptera, Hemiptera, and Hymenoptera, having been attacked. One of the earliest accounts of such an occurrence appears in the Philosophical Transactions (for 1763) of the Royal Society, and as it is rather curious I will copy it:—"The vegetable fly is found in the Island Dominica, and (excepting that it has no wings) resembles the drone, both in size and colour, more than any other English insect. In the month of May it buries itself in the earth, and begins to vegetate. By the latter end of July the tree is arrived at the full growth, and resembles a coral branch, and is about three inches high, and bears several little pods, which, dropping off, become worms, and from thence flies, like the English caterpillar." The animal attacked is supposed to be the larva or pupa of a *Cicada*, and the fungus *Torrubia sobolifera*; but of course the incidents of the latter part of the story are all or mostly imaginary.

The conidiiferous state of certain *Torrubiæ* are like some of the mould fungi, and bear the spores, or seeds, attached to threads, which are often massed together to form branching clubs, mealy on the surface from the numerous globose spores. When in this state they were once referred to the genus *Isaria*, which belongs to a different family of the fungi. In the higher, or *Torrubia*, condition, which they may or may not reach (for in the lower, or *Isaria*, otherwise conidiiferous—so called from their bearing the kind of spores termed conidia—condition, the plants reproduce their species), the appearance of the plant is quite different, as it is provided with a stalk, or club-shaped head, often more or less red in colour, and in which the rod-like sporidia (as the seeds in this family are termed) are produced in certain receptacles called perithecia.

As far as I can judge from the description and figure of Mr. Sharp's fungus it *may* be *Isaria farinosa*, the conidiiferous state of the bright red *Torrubia militaris*, which is said not to be uncommon upon pupæ, but is, I think, certainly commoner in the *Isaria* than in the *Torrubia* state, which I have never found. I say it *may* belong to that fungus; but without actually seeing the specimen it is impossible to be sure, as several other species occur in this country. Amongst these are *Isaria arachnophila*, which I have found on dead spiders; *I. sphingum*, a new British species, recently recorded from Kincardineshire, where it was found on dead lepidopterous pupæ; *Torrubia entomorrhiza* and *T. gracilis* upon dead larvæ and pupæ; and *T. myrmecophila* on ichneumons, &c. Then in other countries have been found *T. melolonthæ* upon the cockchaffer, *T. curculionum* upon weevils, *T. cæspitosa* upon grasshoppers, *T. Miquelii* and *T. sobolifera* upon *Cicadas*, *T. Taylori* upon Australian caterpillars; the well-known *T. Robertsii*, so often seen in museums, which is found on the larvæ of the New Zealand *Charagia*, or

Hepialus, *virescens;* and several other species; making in all about twenty-five known to be parasitic on insects.

The cryptogamic parasitism of insects is a subject of which in reality we know very little. In some cases we know that the parasite attacks the living insect; in others, as in the case of some of the above-mentioned *Torrubiæ*, it seems uncertain whether the parasite confines its attentions to dead insects; though as certain *Torrubiæ* have been seen on living insects it is probable that it does not.

This parasitism is not a subject having scientific interest only, for as in the case of the disease of the silk-worm, termed muscardine,—the result of the attack of the fungus, *Botrytis bassiana*,—it sometimes causes serious commercial loss. This, or a similar, fungus sometimes attacks other larvæ, *e.g. Bombyx rubi*. Then there is another cryptogamic plant, known variously as *Empusa*, *Sporodonema*, or *Entomphthora*, the attack of one species of which—the *E. muscæ*—upon house flies, in autumn, must be familiar to everyone, though they may not know what it is. The fly attacked settles upon the wall or window and there dies, remaining, however, attached in a life-like position. A close examination will show that not only is the fly filled with fungus, but that the spores have been shed, and form a kind of halo round it on the surface on which it is standing. Fungi of this class have been noticed attacking wasps, as well as *Aphides*, and certain lepidopterous insects,—as the larvæ of *Chelonia Hebe*.*

A great deal remains to be investigated as to the nature of these fungus parasites of insects, not only as to the various species of fungi and the various states they pass through, but as to what insects are attacked, how the fungus gets access to them, how its ravages in the structure of the insect are carried on, and what are the causes which predispose an insect to be so attacked, &c. When we know all this, who shall say that a great deal of light may not be thrown upon certain diseases of the higher animals, including man himself?

For the preservation of his specimens I should recommend Mr. Sharp to pin them into a glass-lidded box (in which a drop or two of carbolic acid may be put), and not to subject them to too much direct handling.

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* The fungus which has recently caused such woeful destruction amongst the salmon and other fish in the rivers of the north of England, is a member of this class. Botanists have not quite made up their minds whether these plants are fungi or algæ.

Perth, N.B., April, 1878.

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. Kirby,
Assistant-Naturalist in Museum of Science and Art, Dublin.

No. VIII. NYMPHALIDÆ—NYMPHALINÆ. ARGYNNIS, AND ALLIED GENERA.

The *Nymphalinæ* consist of a number of well-defined genera, which it is difficult to group into sections, but which, as they are too numerous to treat of as a whole, we will deal with by the use of artificial groups founded on a certain amount of general resemblance to some well-known genus; and in the present paper we will discuss the genera allied to *Argynnis*. The atrophied front legs, combined with the open hind-wing cells, are characters sufficient to prevent the *Nymphalinæ* being confounded with other butterflies.

The two first genera, *Colænis* and *Dione*, are long-winged South American butterflies, whose real affinities are with the *Heliconinæ*. Their colour is usually fulvous, more or less banded or spotted with black. The species of *Colænis* measure about three or four inches across, and the under side is either coloured as above, or indistinctly marked. One species, *C. Dido*, differs from the others in being of a beautiful green, with black markings above, and brown and silvery ones below. It may be known at once by the whole cell of the fore wings being filled up with green. The species of *Dione* have shorter and broader fore wings (except *D. Juno*, which more resembles *Colænis* in shape), and are rich fulvous, spotted or veined with black, and the hind wings and the tips of the fore wings are covered with oval silvery spots beneath. In *D. Vanillæ* even the black spots in the cell are centred with silvery beneath; and in *D. Moneta* and *D. Glycera* the basal half of the fore wings is pale crimson on the under side.

Turning now to the *Nymphalinæ* proper we commence with the East Indian and Australian genus, *Cethosia*. It contains a number of closely-allied and very similar species, which may be distinguished from any other genus by the elegant festooned black and white marginal markings, especially on the under surface of the hind wings. They somewhat resemble *Danai;* and indeed some species appear to mimic *D. Chrysippus*, and others of the genus *Danaus*. The *Cethosiæ* are black, generally with a white or yellow band or white spots or lunules across the tip of the fore wings, and with more or less of the hind wings and of the inner margin of the fore wings filled up either with greenish white or with some shade of tawny or fulvous, and generally marked with rows of black spots. Occasionally the pale portion of the wing is beautifully shaded with purple; and the sexes usually differ considerably, the males being often fulvous or tawny, while the females are greenish white. These insects generally average about three inches in expanse.

Some of the largest and handsomest species among the genera most resembling *Argynnis* belong to the genus *Clothilda*, which is almost confined to Cuba, Haiti, and Central America. They expand about four or five inches, and are tawny, with rows of large black spots towards the hind margins; and one species, *T. Thirza*, Hübn., has deep red markings towards the base. On the under side of the hind wings they are dark brown, without silvery spots, but marked with many slender undulating white lines.

The genus *Terinos*, from the Malay Islands, expands about two and a half or three inches, and is dark brown, more or less suffused or striped with rich purplish blue. The tips of the fore wings are prominent, but obtusely rounded, and the hind margin is suddenly concave below them. The hind wings are nearly square, slightly dentated, and with a more or less prominent projection at the outer angle; towards the hind margin they are generally varied with white or yellow.

Cirrochroa is another East Indian and Australian genus, with less prominent tips, below which the hind margin slopes gradually to the hinder angle. The hind wings are slightly and regularly dentated and curved. The wings are tawny, more or less bordered with black, especially towards the tip of the fore wings; the females of some species are brown. There are generally two dentated submarginal black lines, and a third near the middle of the wings; outside the latter (which is often silvery on the under side) runs a row of brown dots. These insects usually expand from two to three and a half inches; but the smallest, *C. fasciata*, Feld., from Borneo, expands only one inch and a half, and differs much from any other species, being brown, with a broad ochreous band running from the middle of the fore wings to the inner margin of the hind wings, beyond which are two rows of ochreous lunules, the innermost becoming a stripe on the hind wings.

is transversely striated with black: it is common in the East Indies and Africa. The other species (some of which have short tails) may be known from *Cirrochroa*, *Messaras*, &c., by the transverse striations in the cell of the fore wings. *Euptoieta* only contains two common American species, resembling *Atella Phalanta*, but the veins of the fore wings are black, especially in *E. Claudia;* and instead of the wings being edged by festooned lines they are edged by a double brown line, separated by rather long fulvous spots: within this runs a row of large black spots, placed between the nervures; and within this again an obsolete dark line on the fore wings, and an oblique and very irregular black line on the fore wings.

We now come to the genus *Argynnis*. It is numerously represented in Europe, Asia, and North America; but in Africa only on the North coast, and in South America only in Chili. Among the most striking of the larger North American species are *A. Diana*, with a black male, broadly edged with orange, and a green female spotted with whitish; and *A. Idalia*, which has reddish fore wings and blackish hind wings, with two rows of whitish spots. There are several Californian species, with yellowish instead of silvery spots on the hind wings beneath. Among East Indian species we may mention *A. Niphe*, with a fulvous male, and a female which mimics *Danaus Chrysippus* on the upper side. The hind wings are green beneath in both sexes, with slightly silvery markings. Then there are the Indian *A. Childreni* and *A. Kamala*, with the hind wings green beneath, striped with silver; and the North Chinese *A. Sagana*, the male of which resembles *A. Paphia*, while the female is olive-green, marked with white, like an *Apatura* or *Limenitis*, and was actually established as a new genus when first discovered. I have nothing special to say about the smaller group of *Argynnis*, except that it is to this that all the circumpolar, or South American, species belong.

Melitæa is common in Europe, Asia, North Africa, and California; the greatest variety and the largest known species are Californian. Many of these are black, with several transverse rows of yellowish spots, sometimes alternating with reddish ones, thus forming a higher development of the group represented in Europe by *Maturna* and *Aurinia*.

Most of the smaller tawny *Nymphalidæ* of North and South America belong to the genus *Phyciodes*, many of which closely resemble *Melitæa* above, but the under side of the hind wings is yellowish or grayish, without sharply-defined markings. Others have very long wings, and closely resemble small *Heliconii*, or *Eueides*, being marked with black and tawny in a similar manner. Others are black, with white spots on the fore wings, and a broad white band on the hind wings. *P. Castilla* is black, with a red transverse bar across the middle of the fore wings; and *P. Leucodesma*, which is common at Trinidad, is brown, with the greater part of the wings occupied by a broad transverse white band, interrupted below the costa. The short-winged species are mostly rather smaller than an average *Melitæa;* but the long-winged species are larger, and occasionally exceed two inches in expanse.

Microtia Elva, from Central America, is a small black butterfly, about an inch in expanse, with a tawny band running from the anal angle of the hind wings to the middle of the fore wings; beyond it is a transverse tawny blotch of the same colour. *Gnathotriche exclamationis*, from Venezuela, resembles an *Archonias* (*Pierinæ*) in appearance: it is a black butterfly, with a row of oblong yellow spots across all the wings, and a yellow basal streak on the fore wings, followed by a spot. It expands about an inch and a quarter.

The South American genus, *Chlosyne*, contains black species, expanding about two inches. The fore wings are more or less spotted with white, and the hind wings have generally a large red or yellow blotch at the base. The hind wings are rounded and scalloped, and the fore wings slightly concave.

Anemeca Ehrenbergii, from Mexico, expands about two inches. The wings are rounded and entire, and are smoky brown, with yellowish fringes; the nervures of the hind wings and of the hind margin of the fore wings are broadly yellowish beneath, and slightly so on the upper side also.

In my next paper I shall proceed to consider the genera allied to *Vanessa;* but in all succeeding articles I shall deal entirely with exotic insects, as I have done in the present chapter, noticing European species only so far as may be necessary to elucidate the others; and referring those who wish for information on European species, whether British or not, to my work on 'European Butterflies and Moths,' now in course of publication.

MODIFICATIONS OF GALL-GROWTH.

By Edward A. Fitch.

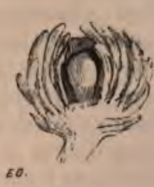


Fig. 1.

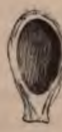


Fig. 2.

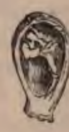


Fig. 3.

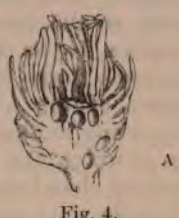


Fig. 4.

In the April number of the 'Entomologist' (Entom. xi. 82) attention was called to the little-understood subject of gall-growth and gall-structure by a consideration of two or three abnormal forms. The perusal of that interesting paper has suggested to me that it may not be untimely to call attention to various other modifications. Not the modifications and monstrosities occasioned through injury or wounds to the gall itself; neither those resulting from its position as to surrounding growths and objects, nor those which may be attributed to suppressed or stimulated growth. With these external developments, of each of which many curious forms could be instanced, the causes are, to a certain extent, explicable by the scientific or observant botanist, but with the modifications that are due to internal influences the case is different; and it is to these—to such as are occasioned by the life within the gall itself—that I wish to direct attention.

In order to make my subject clear, and limit my observations, I shall confine myself specially to the well-known galls of two species of *Cynipidæ*, viz.—*Cynips Kollari* (the common Devonshire, or marble, gall of the oak) and *Rhodites eglanteriæ* (the globular gall of the rose leaf).

Before treating of these, and to serve as a preface to my remarks, I may refer to two instances of abnormal tenancy in galls,—first that of an *Andricus*, then the common history of those frequent lodgers the *Synergi*. A common gall, occurring on oak-buds, is that of *Aphilothrix gemmæ*, which is generally known as the artichoke gall. It consists of a cupule, to which the more or less modified leafy scales are attached, with a peduncular oviform inner gall. The normal section is as at fig. 1; within the central inner gall the larva of the gall-maker lives. This inner gall is greatly modified by immaturely discontinued growth through parasitism, to which it is unnecessary to refer further than to explain that fig. 2 shows the normal section of the perfectly-formed gall; and fig. 3 the same, inhabited by *Synergi*. Within this woody cupule several small oval, hard, but thin-walled chambers are frequently to be found. They are irregularly distributed; sometimes three or four are arranged side by side on the exterior of the woody growth; at others they are quite without any method, and I have found them as far down the twig, to which the gall is attached, as shown at A in fig. 4. It is these chambers that are the home of *Andricus trilineatus*. This is the only instance known of what is considered a true gall-maker being dependent on another. With this exception the galls and habits of *A. trilineatus* accord somewhat with those of its congener, *A. noduli*. The larva chamber in all single-celled or unilocular galls continues, under natural circumstances, single and hollow; but when these galls become tenanted, with those cynipideous inquilines of most of the cynipideous galls—the *Synergi*, they all exhibit in section several secondary chambers, divided by a thin vegetable septum. The study of these occasional growths is certainly necessary for correct views of the physiology of the gall itself.

Now to return to our more observable instances. First the production of *Cynips Kollari*. Its normal structure is a smooth, brown, spherical, woody or parenchymatous gall, containing a small more or less oval larva chamber in the centre (see fig., Entom. vii. 241): this is moderately hard, owing to the density of structure; the parenchyma—or what is perhaps more correctly described as merenchyma, from the openness of the structure—is entire, and radiates from it. Two internal and constant modifications occur. The first is when we find two or three chambers in the parenchyma of the gall (see figs. A and B): these are generally small, single, and invariably placed very near the base of the gall itself. The outward indications of this is small, as the gall appears perfectly normal, and the central larva chamber not being affected the life of the cynipideous tenant, or its parasite, is not interfered with. These chambers are inhabited by inquilines, mostly, if not exclusively, by *Synergus melanopus* or its parasites: their presence is to be discovered by a very minute swelling and slight discoloration (lighter) at the point affected; the perforature of oviposition is also observable in the rind. The second modification and the most easily-recognised abnormal forms of *Kollari* galls are the half-sized, irregularly shaped, and slightly discoloured specimens which are so commonly met with, and which invariably lose their green colour (*i.e.* become ripe) later than normal specimens. In section these will show the larva chamber to be greatly enlarged and the whole structure altered: the parenchymatous tissue is hardened, and the surroundings of the central cavity is thick and hard; in fact the whole cellular tissue is condensed. This central cavity is filled with numerous chambers separated by thin septa, as before instanced in other cases of synergous tenancy: in these the *Synergus* larvæ reside. They are vegetable feeders, consequently the sap (plant juices) is appropriated by them, and the gall becomes dwarfed, and its tissues improperly nourished. Various forms of this modification occur, but it is unnecessary to particularise them: a section of one is shown in the accompanying figure (see fig. C).

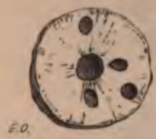


Fig. A.

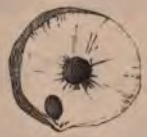


Fig. B.

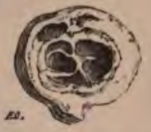
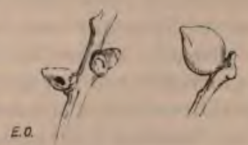


Fig. C.

Particularly small, thin-walled, woody, slightly pointed, conical galls are frequently met with amongst those of *C. Kollari*. These are, I believe, galls of that species modified by a species of *Synergus*: one egg is laid in the immature cell of *Kollari*, and, as before, the sap is appropriated by the tenant, but to a greater degree than in the former many-chambered instance. It is necessary to say that the history of the production of this form from *Kollari* is only surmise; its actual proof is difficult.



Small *C. Kollari* galls.

The production of *Rhodites eglanteriæ* is a thin-walled, globular, glabrous, green or rosy gall, occurring normally on the under side of the common wild rose (*Rosa* spp.): for section see fig. *a*. As an instance of the gall being unaltered, notwithstanding its production on varied organs of the plant, I may say I have found galls of this species on the side veins, midrib, and leaf-stalk of the leaflet (upper and under side); on the petiole and stipule of the leaf; and even once on the fruit of *Rosa canina:* all perfectly normal forms. The constant modifications of this gall are two, both curious and interesting. Firstly—the whole interior becomes grown-up and irregularly filled with chambers; for section see fig. γ: the only outward sign is the gall becoming brown and covered with small scattered knobs. Secondly—the normal central cavity remains, but the wall of the gall becomes thickened and regularly divided into chambers; a section of a good specimen of this modification, with the peripheral chambers complete, is particularly striking and pretty: see fig. β. The specimens are often abnormally large and, like the former, become discoloured, and the surface becomes less glabrous and more or less warty. These two modifications are due to a similar cause with those in the oak species, *viz.*, the tenancy of phytophagous individuals. I am unable, at present, to say whether they are both attributable to the same species, for from specimens of both forms I have bred *Aulax canina*, *Eurytoma sp.*, and various parasites. *Aulax*, which is closely allied to *Synergus* and has doubtess the same economy, is the primary cause of the modification; but as to the *Eurytomidæ* it is an undecided question whether they are vegetable or animal feeders in the larval state.

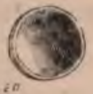


Fig. α.

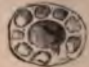


Fig. β.

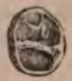


Fig. γ.

The dwarfing of all galls through inquilinism and parasitism is well known and self-explanatory; but a consideration of the above-mentioned forms with those peculiar growths, mentioned in "Considerations of Gall-growth," may lead to some knowledge of the interesting, though still obscure, subject—the cause and growth of vegetable galls. In the animal kingdom we know that different irritants produce distinctly characterised effects, so in the vegetable kingdom we know that different species of insects produce different kinds of morbid growths which are especially constant; but just as in animal disorders we frequently deal with the symptoms rather than with the evil itself, so in the vegetable world it is only by minute observation backwards, step by step, from the completed morbid growth that we can hope to arrive at its origin, and thence possibly at its cause.

Maldon, Essex, April 3, 1878.

DESCRIPTIONS OF OAK-GALLS.

Translated from Dr. G. L. MAYR'S 'Die Mitteleuropäischen Eichengallen.

By EDWARD A. FITCH.

(Continued from p. 115.)

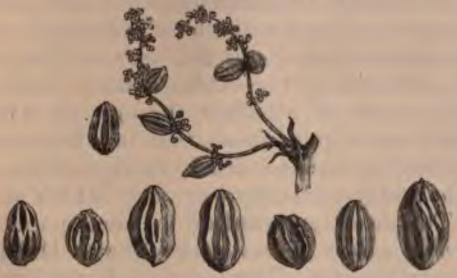


Fig. 84.—ANDRICUS QUADRILINEATUS.
Fig. 85.—A. PEDUNCULI.

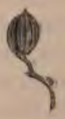


Fig. 86.
A. VERRUCOSUS.

84. *Andricus quadrilineatus*, Hart. 85. *A. pedunculi*, Schenck.—Professor Schenck, in his 'Beiträge zur Kenntniss der nassauischen Cynipiden und ihrer Gallen,' published in 1865, described a number of gall-species which are produced on the catkins of the oak, and which resemble one another in appearance very closely. Almost the whole of these forms he described from the specimens which are contained in Von Heyden's collection. Through the kindness of Herr v. Heyden I have been enabled to examine these types, so that I am now in a position to rectify some errors respecting those which belong here. Galls collected by me both last year and in the present still contain larvæ, consequently there has been no emergence. The species which I have taken into consideration are *Andricus quadrilineatus*, Hart., *A. flavicornis*, Schenck, *A. pedunculi*, Schenck, *A. ambi-*

guus, Schenck, and *A. glabriusculus*, Schenck. From Professor Schenck's description in the above-cited work (pp. 111 and 112) it is easy to see that the galls themselves differ from one another, yet when I compare these types together and those galls which belong here, collected by myself from the same tree, I do not find the least substantial difference between them; still the matter might be otherwise if the *Andrici* preserved in Heyden's collection were put by together with the actual galls in question from which they were bred. It may, therefore, be judicious to retain the Schenckian species specially. *A. quadrilineatus.*—The gall is brown, smooth, oviform, three millimetres long by two thick; its periphery is uneven, as it is traversed with raised longitudinal stripes, which are are more or less united; it might also be described as having moderately deep, partly interrupted and distinct partly confluent longitudinal furrows. The dried perianth may be found at the base of the gall, and there is a rather conspicuous papilla at the apex. The gall, when broken open, exhibits a very thin, oviform, yellow-coloured inner gall, which is attached through its whole surface to the reddish brown gall tissue: that this tissue was at first soft, and later on became dried, there can be no doubt, owing to the ridges and furrows with which it is normally covered. The insect gummed on the same paper as the gall is an *Andricus*, which agrees perfectly with Hartig's description of *A. quadrilineatus*. The types of *A. flavicornis* consist of ten galls and one *Andricus*; the galls do not differ at all from those of *A. quadrilineatus*. This is the opinion also expressed by Prof. Schenck; only I must remark, for the sake of accuracy, that in some of these the furrows here and there through being deepened have convex surfaces, so that by the drying of the gall tissue the inner gall becomes exposed at these spots. In other shrivelled specimens this also happened in different ways, and the appearances described above were only due to it being a later gathered gall. The typical *Andricus* is undoubtedly a different species from *A. quadrilineatus*. It certainly is possible, but is not probable, that two undoubtedly distinct insects should be bred from exactly the same species of gall from the same part of the tree of which the species is already known. We must leave it to time to clear up this difficulty, and so let both species remain at present, for I have no grounds for doubting the accuracy of the late Senator v. Heyden. The types of *A. pedunculi* are before me: they consist of a gall and an insect on the same card, from v. Heyden's collection. The gall agrees exactly with those specimens of *A. flavicornis* which have narrow deep depressions between the ribs instead of the furrows. The *Andricus* (a female) is undoubtedly distinct, according to Prof. Schenck's description; but I have myself found no difference, notwithstanding a detailed examination; so will begin with Prof. Schenck's description, that the antennæ of the female of *A. pedunculi* are 14-jointed, whilst in *A. flavicornis* they are 13-jointed; however the former species has only 13-jointed antennæ. The thorax and abdomen, according to Schenck, are black in *A. pedunculi*, however they are coloured, just as in *A. flavicornis*. He says the scutellum is more or less pointed at the apex; however the typical specimen only shows at the most an undoubted partial enlargement of a fold, which is quite immaterial. There is, then, no difference either between the gall or the insect of the two species, *A. pedunculi* and *A. flavicornis*, so that I can accept them as distinct; but the name *A. pedunculi* must be retained, as Schenck has described this species first. Of *A. ambiguus* the gall only is known. Prof. Schenck was so friendly as to send me the types, which do not differ essentially from the other galls here described, with the exception perhaps that they are still red in colour, are both immature, and have altogether a fresher appearance. One specimen is altogether in accordance with the description given by Schenck, in that it is more nearly spherical, and is furnished with irregular, undulatory, narrow and sharp longitudinal striations; it is, however, more immature than the second specimen, which has thick, swollen, regular, straight striations, with narrow furrows between them, but it has also a stretched-out form. Of *A. glabriusculus* the gall only is also known: the five types from which it is described, from Von Heyden's collection, are before me. Two specimens agree perfectly with the galls of *A. quadrilineatus* and *A. pedunculi*; of a third specimen there is hardly anything but the inner gall existing, the greater part of the gall substance having gone. Two specimens are more clearly distinguished; they have only fine, irregular, faintly raised ribs, which run in a longitudinal and oblique direction, so that these specimens come very near to the next species (*A. verrucosus*), although that is described as doubtfully distinct. The galls collected by me from *Quercus pedunculata* (mentioned above) I cannot assign to any other species than *A. quadrilineatus*, Hart., or *A. pedunculi*, Schenck, until I have succeeded in breeding the gall-flies. The galls were found in May, and were then, in the fresh state, succulent, as yet exhibiting no ribs; but in a few days partly shallow, partly deeper, longitudinal furrows were developed. They have now the same various appearances as the Schenckian types.—G. L. Mayr.

These galls are, I believe, common, and generally distributed in Britain, but unnoticed. Dr. Traill has found them in several localities in Scotland; and I have met with them in widely separated districts in Essex. Unless careful, we here get into great confusion of nomenclature. Like our common currant gall of the oak (*S. baccarum*) there are two forms of this species—the leaf form, and the catkin form. The description of the former has already been translated as a distinct species (*Aphilothrix marginalis*, Schlecht., Entom. x. 298); and of the latter, from above, we see how many are the varieties, which they certainly are, as is also doubtless the species next described. Of these the two chosen names of Schenck appear unfortunately to be *A. pedunculi* and *A. verrucosus*. *Pedunculi* was applied by Linné to the catkin form of *S. baccarum;* and *S. verrucosa* of Schlechtendal, a very distinct species, is described in the 'Entomologist' (Entom. x. 249). It is, therefore, certainly not only convenient, but necessary, that these two names, applied to the galls now under consideration, should be dropped, and that this species should be known as *Andricus quadrilineatus*, Hart., only. From these galls I have bred *Callimome auratus*, Fousc., a species of *Pteromalus;* and one specimen of another unknown *Chalcid.*—E. A. Fitch.

86. *Andricus verrucosus*, Schenck.—The typical gall, from Von Heyden's collection, is brown, oviform, with a longitudinal diameter of 5·2 millimetres, and a horizontal one of 3·5 millimetres; its surface exhibits wide, separate, soft, rather indistinct, slightly raised, longitudinal striations and irregularly placed warts; its apex bears a prominent papilla; it occurs on the catkin stalk, and the remains of the perianth and anthers may sometimes be recognised at the base. Whether this gall belongs to a distinct species, or is only that of *A. quadrilineatus* or *A. pedunculi*, modified by *Synergi*, is doubtful, for a *Synergus* only was bred from it.—G. L. Mayr.

Doubtless a variety of the former species. I do not find that Dr. Mayr has named the above-mentioned *Synergus*, or again referred to it.—E. A. Fitch.

NOTES FROM UTAH.

By the late ANDREW MURRAY, F.L S.

[THE accompanying notes, of a few points of insect life round Salt Lake City, are taken from one of the letters written home by Mr. Andrew Murray during his Californian expedition in 1873, and will probably be read with interest by others, besides the friend and fellow-worker in his special field of Economic Entomology to whom they were originally sent, although merely slight observations (jotted down without any view to publication) of such matters as caught his attention in the intervals of business. The alteration of the climate by irrigation, and the, apparently, consequent attack of the sage-brush by gall insects, was a subject in which he took much interest, from its possible economic results eventually on the vast tracts useless, or almost useless, from the presence of the *Artemisia*. Of these galls he brought home many specimens, of which the different kinds are now represented in the economic collection at Bethnal Green.]

Of insects one of the most interesting is the large, black, slightly bronzy cricket, on which the Indians used to feed, and which nearly destroyed the early crops of the first settlers.

The beetles are mainly of the Europeo-Asiat. American type, very much like our own. I have three or four specimens of a *Carabus*, like *C. campestris*. On the margins of the streams plenty of *Peryphus*, *Bembidium*, and their congeners; but there is one difference in the largest *Bembidium*. With us they run with great swiftness in the hot sun; but this species on the smallest provocation opens its wings like a *Cicindela*, and flies off. It seems only to make a little flight, but I have never been able to see one alight. The *Cicindelas* in the warm days in the glens are in great numbers, but fly off so quickly that I have only got one or two: most of them are the common Eastern species, *C. repanda*. A slight element of Californian species shows itself:—a *Cremastocheilus*, two or three *Eleodes*, &c.; only one *Curculio;* two *Elaters;* and a fine burying beetle, like a magnified *N. vestigator*. There are plenty of dead mules and dead cattle, but they set fire to them here; and almost every little patch of cow-dung in the pasture has also been fired.

The butterflies are not numerous in species, but in the canons are tolerably plentiful in individuals. The commonest seems a small skipper, which I have not yet caught. Then the American variety of our Camberwell Beauty is next: it is very beautiful on the wing, and is so strong and solid and big that whether in passing you or in touching it, as in knocking it down, it feels more like a bird than a fragile butterfly; it has a way, too, of soaring or gliding about like a hawk or a swallow, that is, bird-like, although it lilts about, too, like other butterflies. Then there is a white, which I have not caught, but which I think will turn out to be a *Hipparchia*, like *H. Galathea;* one or two *Argynnis;* and an American species, which I recollect by head-mark, but not by name.

The poplars, or cotton-woods, in the streets, are terribly mangled by a *Cossus:* its holes are just like those of our own *Ligniperda;* but its chrysalids, of which the remains stand still sticking out of the holes, are more like those of the leopard-moth in size and appearance. The cotton-wood is a poplar with a white bark and a sharp brown bud; that is all I can say yet. I picked a twig two days ago with the ring of eggs of the lackey-moth round it, exactly like our own; and to-day on opening the bag, in which I had put it, I find the caterpillars had begun to come out,—little black, tiny things, like our own. It is a different species I know, from memory, but I forget its name.

Galls are numerous on the oak (a low-growing scrub-oak, called the burr-oak); even although leafless I have found three galls still lingering, two on the branchlets and a third in the axils of the buds and leaves; and I observe, both on these and on injured twigs of cotton-wood, and by the wayside, that the infested and injured twigs continue to bear the remains of their leaves while the normal twigs are leafless. The sage-brush (*Artemisia ?* sp.) carries three galls. I think it is chiefly so affected in the neighbourhood of this city. There are three kinds :—one, the common sage-brush, that cattle will only eat in the last extremity, but which still keeps them alive; another kind, called white sage, which they like better, and on which they fatten; and a third. The reason of the prevalence of galls on it here (if it is really as it seems to me) may be that the plants are not thriving,—suffering from the improvement of the climate; for it seems that the cultivation and irrigation are producing a change in the climate. A brick-maker told me that "adobes," or sun-dried bricks, could be made and used ten years ago when he came; now they did not answer. The climate, too, was less severe in winter; rain had now begun to fall occasionally in summer; when he came there were no dews, now there are; while fifty to a hundred miles to the south beyond the settlement there is no dew yet.*

Salt Lake City, April 22, 1873.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

VANESSA ANTIOPA AT KEYMER.—*Vanessa Antiopa* was captured at Keymer, Sussex, by Robert Chatfield, on April 28th last. There is only one other recorded instance of this species having been seen there. This is evidently a hybernated specimen, and is a little worn.—M. CLIVE-BAYLEY; 56, Portland Place, London, W.

COLIAS EDUSA HYBERNATING AS A LARVA.—As a contribution to the life-history of this butterfly I will relate my experience during last winter. I had some larvæ, which were hatched in September. These fed all through the winter, except when very cold, when they became quite torpid, and seemed to be almost frozen. I started with thirteen, but these gradually died off; so that in February I was left with three in their last moult, and two small ones. Some thief of a bird, either a robin or a wren, got through a broken pane, and stole the three large ones at one time. I was then left with the small ones only, one of which unfortunately died; but the other fed on, and changed to a pupa on April 11th. On May 2nd this produced a fine female imago; so it was but twenty-one days in the penultimate state.—H. JOBSON; 7, Reform Terrace, Park Lane, Tottenham, May, 1878.

COLIAS EDUSA IN SPRING.—I have to record that three specimens of *Colias Edusa* were seen flying, on April 22nd, by Mr. W. H. Liversidge, while driving near Ryde. Does not this argue that the insect does hybernate as an imago, whatever it may do in the larva state?—COLLIS WILLMOTT; 194, Mare Street, Hackney, April 29, 1878.

[Briefly referred to in last number.—ED.]

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* The "Reports on the Zoological Collections of Lieut. W. L. Carpenter, made in Colorado during the summer of 1873" (Washington, 1875), goes rather fully into the insect fauna of this district. Baron C. R. Osten Sacken, who notices the galls, refers to three species of oak-galls: some *Nematus* galls on willows; a species of gall formed by *Aphides* (*Pemphigus*) on the leaf-stalk of the cotton-wood, and from the pupa-shells, found inside the sage-brush galls, he refers the gall-maker to the genus *Trypeta*.—E. A. F.

COLIAS EDUSA IN MAY.—On Saturday, May 18th, I was walking up the Finchley Road, near Platt's Lane, when a fine *Colias Edusa* flew across the road within five yards of me. Shortly afterwards two more (apparently females) passed me; and later on in the day, between four and five p.m., I saw two others in a field, near the Willesden Lane.—R. T. GIBBONS; Chilton Villa, Loveridge Road, Kilburn, N.W., May 23, 1878.

FOOD-PLANTS OF GONEPTERYX RHAMNI.—In the 'Entomologist' for July, 1875 (Entom. viii. 160), there appeared a communication from me, wherein I stated that *Gonepteryx rhamni* had been reared from eggs deposited on "a scrubby *Alaternus*" growing in my garden. The shrub in question, having been invoiced to me under that name from a well-known nursery, I did not doubt the correctness of it until lately. On sending a piece, however to the garden department of the 'Field,' it was identified as *Maytenus Chilensis.* On looking it up I find that the genus *Maytenus* is closely allied to *Rhamnus*, especially to *R. alaternus* (which last species, by the way, I am told has been lately placed in a separate genus). *M. Chilensis* bears, in April or May (according to the season), a profusion of small greenish flowers having a strong perfume, which, although not particularly sweet, seems to have a strong attraction for insects, and most probably first drew the attention of the butterfly. Larvæ have been found on it every year since, and now there are several eggs waiting to be hatched.—N. C. TUELY; Mortimer Lodge, Wimbledon Park, S.W., May 6, 1878.

LEPIDOPTERA IN NORTH WALES.—On the 2nd of May I was working for Lepidoptera in the woods about Llanrwst, and was astonished to see *Lycæna Argiolus* in abundance. By throwing stones at the holly bushes (which grow here to an immense height) I was enabled to induce the butterflies to make a descent. Owing to the difficulties of the situation I could only manage to secure eight females and one male, but must have missed quite a score more. I took also *Tephrosia biundularia*, at rest, on the larch; but owing to the north-east winds, which continued over a week, nothing else worth mention turned up.—S. D. BAIRSTOW; Woodland Mount, Huddersfield, May 12, 1878.

ACHERONTIA ATROPOS IN NORTH IRELAND.—A friend of mine has to-day brought me a remarkably fine specimen of *Acherontia Atropos*, which he caught yesterday near the sea-shore, at rest, on a piece of wood.—T. BRUNTON; Glenarm Castle, Co. Antrim, N. Ireland, May 9, 1878.

ACHERONTIA ATROPOS AND DEIOPEIA PULCHELLA IN DEVON.—I think the following two captures by one individual in one week during this month worthy of record, *viz.*—on May 6th a very good specimen of *Acherontia Atropos* was found; on May 11th was captured an example of *Deiopeia pulchella*, which was slightly worn, but otherwise in a good state of preservation, and now in my possession. Both were taken on the South Devon coast by a gentleman's servant, who, although no entomologist, was struck by their appearance; and he says that the former cried like a child. I may add that in September, 1875, I was fortunate enough to procure seven specimens of *D. pulchella* in this same locality.—ARTHUR H. WALKER; Southgate, Middlesex, May 22, 1878.

ACRONYCTA ALNI.—I have bred two splendid specimens of this rarity from larvæ beaten from oak in Kent, last August.—WM. MACHIN; 22, Argyle Road, Carlton Square, E., May 23, 1878.

DESCRIPTION OF THE LARVA OF NOCTUA DITRAPEZIUM.—On the 19th of May, 1877, I received larvæ of this species from Mr. T. W. Salvage, of Brighton. Length about an inch and a quarter, and tolerably stout in proportion. Head polished; it has the lobes rounded, and is narrower than the 2nd segment. Body cylindrical and of nearly uniform width throughout, only tapering slightly towards the head; segmental divisions distinct, but not deeply notched; skin soft and smooth, having very few, almost imperceptible, short hairs. The ground colour is of various shades of ochreous-brown; in some being almost yellowish, in others of a strong purplish tinge; in all cases on the centre of the dorsal area the ground colour is almost obliterated by a series of large, lozenge-shaped, dark brown blotches, one on each segment; this dark brown colour is also suffused along the sides, a series of still darker oblique marks, one extending upwards and forwards from each spiracle, being very noticeable. Head yellowish brown, with a very dark brown stripe extending from the summit of each lobe to the mandibles. A very fine pale gray line, extending through the lozenge-shaped marks, forms the dorsal stripe; along the subdorsal region is a series of short black stripes, becoming more conspicuous towards the posterior extremity, and forming on the 12th segment two distinct attenuated triangular marks, the apex of each pointed anteriorly, and joined at their bases by a transverse black stripe, edged outwardly with bright yellow; spiracles conspicuous, oblong, yellowish white. The ventral surface varies according to the colour of the dorsal area, being almost uniformly dull pale ochreous, or purplish, as the case may be. Feeds on birch, and in a state of nature probably also on various low plants.—GEO. T. PORRITT; Highroyd House, Huddersfield, May 16th, 1878.

ANARTA MYRTILLI IN APRIL.—I took on April 18th a fine specimen of *Anarta myrtilli*. Is not this unusually early? Stainton's Manual and other books give it as flying in June or July. It is too fresh and bright to be a hybernated specimen; and it is undoubtedly *A. myrtilli*.—E. CROSS; Appleby Vicarage, Brigg, Lincolnshire, April 28, 1878.

HELIODES ARBUTI NEAR LONDON.—During the present week I have been taking several specimens of *Heliodes arbuti* in a meadow here, within five miles of the metropolis. This is, I believe, a new locality for this pretty species. They seem to keep to one corner of the field, flying about whenever the sun is shining. I may mention that in the field chickweed, on which the caterpillar is said to feed, is particularly abundant here.—N. C. GRAHAM; Silwood, Tulse Hill, London, S.W., May 7, 1878.

XYLOMIGES CONSPICILLARIS.—While strolling along the road from Dartford to Darenth, on the 27th of last month, I found two specimens of this rare species, one on a post, the other on a fence, close to the Gore Farm. I have searched for this insect sixteen or seventeen years, but never saw it alive before. Imagine my surprise at finding two in less than twenty minutes.—E. G. MEEK; 56, Brompton Road, S.W., May 13, 1878.

XYLOMIGES CONSPICILLARIS.—On April 23rd last, whilst collecting in the neighbourhood of Dartford, Kent, I had the good fortune to capture a fine male *Xylomiges conspicillaris*. I found it on a fence, near a large clover field. Mr. H. Packman, of Dartford, captured one on April 27th. This specimen is also in fine condition.—EDWARD R. SHEPPARD; 13, Limes Villas, Lewisham, Kent, May 14, 1878.

THERA VARIATA.—I have just been looking at a pupa of *Thera variata*, and to my surprise found it had all the lines, as seen on the larva, well defined on the pupa. Are there any other pupæ that bear the markings of the larvæ?—G. C. BIGNELL; Clarence Place, Stonehouse, Plymouth, May 18, 1878.

CAPTURES AT EPPING FOREST.—On the Saturday after

Easter Monday I went to the forest in the hope of again taking *Perittia obscuripunctella* and *Chrysocoris festaliella.* but the wind being northerly nothing would move, except two or three wasted *Anticlea derivata.* After working for some time in vain I turned my attention to the thistle-stems, and secured a good supply of the pupæ of *Ephippiphora pflugiana;* and on my way back to Chingford Station I examined the plants of stitchwort (*Stellaria holostea*), common in the hedges. These produced *Coleophora solitariella* in plenty, nearly full-fed. On a subsequent visit to the forest I met with the following:—*Elachista obscurella, Perittia obscuripunctella, Grapholita obtusana, Stigmonota puncticostana, Lobesia reliquana,* and *Dicrorampa plumbana; Pyrodes rhediana* were common. The grandest capture was a splendid specimen of *Ephippiphora obscurana,* beaten from hawthorn. I have bred *Gelechia acuminatella* in profusion from larvæ, found in October last, mining the leaves of thistles, on Hackney marshes. Two larvæ found on the same plants, and which hybernated, have now produced *Noctua rubi.*—WM. MACHIN; 22, Argyle Road, Carlton Square, E., May 23, 1878.

ENTOMOLOGY AT THE ROYAL ACADEMY.—It is, we conceive, a thing to rejoice over, when a master of acknowledged standing in the highest walks of art—a learned, thoughtful, austere, and thoroughly academical painter—condescends to execute a designedly and deliberately comic picture. This is what Mr. E. Armitage, R.A., has done in his genial and playfully humorous work—(111) "An Entomological Sale." The more classical painters who occasionally unbend, the merrier. One of the most irresistibly funny collections of caricatures extant is that engraved by Wenceslaus Hollar, from the pen-and-ink drawings of Lionardo da Vinci. John Leech, Richard Doyle, Hablot Browne, never drew such funny faces as those traced by the immortal painter of the "Cena;" and here we have the grave and dignified Mr. Armitage giving us the humours of an auction of a choice collection of insects, and constructing a genuine comedy which H. J. Byrons might prize and J. L. Tooles adore. Never mind if the old gentlemen who are poring over the "lots" are "beetle-stickers" and "butterfly-butchers." They are aware of what they are about; they know their Kirby and Spence by heart; they can afford to meet with a cheerful smile the sneers which are occasionally levelled at the pursuit of the science of Entomology; and they hold with the sage that insects are thoroughly worthy of the deepest study, inasmuch as they are "Nature's favourite productions, in which, to manifest her power and skill, she has combined all that is either beautiful and graceful, interesting and alluring, or curious and singular, in any class of her children." All honour, then, to Mr. Armitage's knot of eccentrics, whose vocation and delight it is to collect specimens of the wonderful little creatures that leap, that run, that fly, that walk, that bore into the ground, that drive galleries through timber, that disport themselves in the air or gambol in the water, that gleam with phosphorescent radiance, that furnish us with silk, honey, wax, and lac, that build structures more marvellous than the pyramids, and that can upon occasion defend themselves stoutly, and, with poisoned weapons, resent the outrages of the tyrant Man. What is he, after all, with his two eyes and two legs, when yonder tiny thing, crawling on the rim of a wine-glass, has eyes by octaves and legs by the dozen? Mr. Armitage's whole picture, with its quaint motto, "Beati Possidentes," is replete with qualities of quaintness and sober drollery; and the entomological specimens on the auction room table, with the other details, down to the matches "warranted only to light on the box," are most dexterously and effectively rendered.—'*Daily Telegraph*,' May 18, 1878.

ANSWERS TO CORRESPONDENTS.

SPHINX LIGUSTRI.—Does the larva of *Sphinx ligustri* change its skin only once? I see by 'Larvæ of the British Lepidoptera, and their Food-plants' (part 1, p. xxiv of the Introduction), by Owen S. Wilson:—"Some lepidopterous larvæ change their skins many times, others but few, *Sphinx ligustri* but once;" and by the plates some of the *Sphingidæ* have the horn on the 12th, but most of them have it on the 13th segment, and many of them have fourteen segments. Is this correct? I was taught by an old entomologist that all larvæ had thirteen segments, the head always considered the 1st.—W. CONDY; Laira, May 18, 1878.

[Newport, quoted by Packard, 'Guide to the Study of Insects' (p. 63), states that the larva of *Sphinx ligustri* moults six times. The body of the larvæ of Lepidoptera consists of thirteen segments, counting the head as one; never, I believe, of fourteen. In the larvæ of the *Sphingidæ* the horn, when present, is on the 12th segment.—ED.]

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DESCRIPTIONS OF OAK-GALLS.

Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen.'

By Edward A. Fitch.

(Continued from p. 136.)

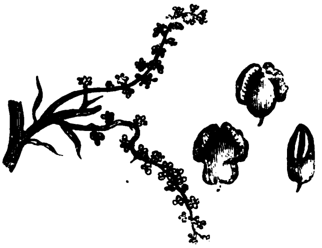

Fig. 87.—Galls of *Andricus Schlechtendali* of the natural size on the catkin, and magnified.

87. *Neuroterus Schlechtendali*, Mayr (*Andricus burgundus*, Schlechtendal).—This very small gall is to be found in May, during the blooming time of the oak, on the catkins of *Quercus sessiliflora*, *Q. pedunculata*, and *Q. pubescens*. It consists of a greenish yellow swelling of the stamen and connective, in such a manner that the divisions of the bloom become more crowded below, less above, or not separated. The stamen mostly attains to a diameter of 1 millimetre, or somewhat over; the chamber is, in the mature gall, surrounded by a moderately hard shell, as an inner gall, on which the succulent part of the gall lies after withering. After the general fall of the catkins, when their stalks become quite withered, some generally remain on the tree: it is on these that many examples of this gall, which are still green, are to be found; and it is about this time that the galls themselves fall to the earth, so that if we now shake a tree bearing these galls they fall in immense quantities. On May 22nd and 25th of this year (1871) I found the galls in great numbers near Vienna, mostly on *Q. pubescens*. Several times I found the galls of *N. Schlechtendali* and *Andricus amenti* together, on the same catkin. Herr v. Schlechtendal found the galls on May 7th, 1869. He kept them on wet sand, and obtained the small gallflies on July 28th of the following year.—G. L. Mayr.

This inconspicuous little catkin gall has not been recorded as British. Probably it occurs here, but has been overlooked. —E. A. Fitch.

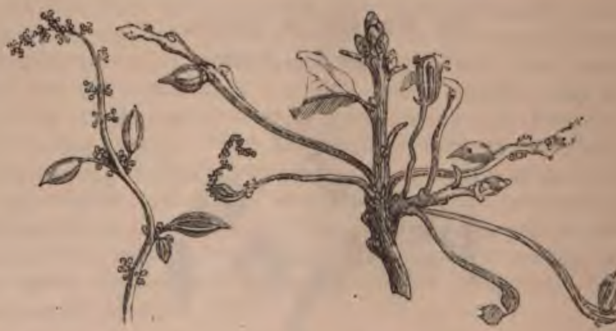

Fig. 88.—Galls of ? *Cynips seminationis*. Fig. 88 A. Of ? *C. inflorescentiæ*.

88. ? *Cynips seminationis*, Gir. (? *Cynips inflorescentiæ*, Schlechtendal).—This gall, which, according to Dr. Giraud, is to be found on *Quercus pedunculata*, and bears a great resemblance to the gall of *Aphilothrix callidoma*, occurs on a catkin with a thickened stalk. It is of about the size of a barley-corn, or slightly smaller, spindle-shaped, pedunculated or sessile, and covered with few or many more or less sharply defined, often quite indistinct, longitudinal ribs. The green, later brown, often (as *C. inflorescentiæ*) bearing red longitudinal striations, gall is covered with deflected, light, short, scattered hairs, and bears a papilla at the apex; at the base it is encircled with a dense wreath of hairs. According to Dr. Giraud the gall falls in the latter half of May. The gall-fly is quite unknown.—G. L. Mayr.

From Dr. Giraud's description this appears to be a form of the rather variable gall of *Aphilothrix callidoma*, Hart. (Entom. viii. 290), but can be referred to no species with certainty, as the *Cynips* has not been bred. According to Dr. Mayr a female of *Synergus albipes*, Hart., and *S. facialis*, Hart., have been bred from these galls at the end of July of the same year.—E. A. FITCH.

COLLECTED OBSERVATIONS ON BRITISH SAWFLIES.

By the late EDWARD NEWMAN.

(Continued from p. 91.)

PROCEED we now to distribute the Hymenoptera, to which the sawflies undoubtedly belong. The grand divisions are four, as usual; and these are dependent on food and economy. There are various classifications of this interesting group, all more or less dependent on that character; so that the task of distribution is comparatively easy. However different our systems may appear on paper, there is evinced a concurrent disposition to employ these as the leading principles; and Nature, the great mistress and teacher in the matter, appears to have marked them with unmistakable clearness.

1. *Pædotropha*, in which the eggs are generally laid in cells prepared for their reception. When the larva emerges it is fed by the parents; mouthful after mouthful is brought as required, and placed in the mouth of the young one, which is helpless as an infant. All these have three sexes.

2. *Creophaga*, which store up insects of all kinds, also spiders, for the food of their young. It is said that these poor creatures receive a sting from the parent at the time of incarceration, and that this deprives them of all muscular power. Although these poor prisoners remain dormant, yet they are not absolutely dead; at least the prey remains perfectly fresh until required for the food of the larvæ.

3. *Biophaga*, which, in the larva state, live entirely on the living fluids of other insects, feeding until the skin, or exoskeleton, remains a shrivelled and empty sack; it then sometimes emerges to undergo its transformation to a pupa; but this change more frequently takes place inside of the skin. This may be truly said to be feeding on life.

4. *Phytophaga*, which eat nothing but plants, generally the tissue only of the leaves, but sometimes also the pith and solid wood.

These, however, require a rather more detailed description.

1. The *Pædotropha*, or children-nurses. Sociality is the general attribute of this group—bees, wasps, and ants. The young are invariably apod. The food supplied by the parents is principally the honey of flowers, and the honey-dew secreted, or supposed to be secreted, by plant-lice. St. Fargeau informs us that the young of wasps are fed with particles of more solid food, and that whenever the feeder appears they open and shut their mouths, like young birds gaping for a grub when brought by their parents. This is by no means the case concerning the bee, for, though fed, the feeder and the fed generally exhibit great affection for one another, though perhaps a kind of cupboard-love. The colony consists of three kinds of individuals—male, female, and neuter. The neuters do the work of the colony: build the hive, feed the young, and make themselves generally useful. It may be stated that they sometimes take the management of the community into their own hands; for DeGeer tells us of the ants, that they have been seen to kill and devour the babies: this may arise from the difficulty of procuring food for them. This same operation takes place also with the hive-bee in the destruction of the drone. The females and neuters are provided with stings, which seem for this purpose only; at least they are very inefficacious as weapons of either defence or offence. Three natural orders comprising this family build those remarkable cells which have excited the wonder and admiration of all; and these architectural powers are abundant sources of speculation. Imaginative and florid writers have invested the subject with an interest that makes it so; for the same phenomena take place in hexagonal crystals, in basaltic columns, in the facets of an insect's eye, and in a hundred different circumstances, in which the will or instinct, or contrivance or foresight, of the substance cannot possibly have been brought into play. It is desirable that writers on Natural History should direct their flow of glowing sentences to the wonders thickly scattered around them, and which are unmistakable, rather than create wonders out of the most commonplace occurrences which can possibly attract the notice of the uninitiated. The fact of a chicken being hatched by the simple process of incubation is far more wonderful than that ordinary caterpillars should be arrayed as moths. The latter fact is always noticed as remarkable, while the former invariably remains unnoticed. In this order the hexagonal cell is of frequent recurrence; but we must not lay too much

stress on these hexagons, as exhibiting instinct in the fabricator, though no doubt the instinct is clearly displayed, as in all insect operations, but we certainly are aware that the cells have to be constructed as closely approximate as possible, not only to economise space and material, but also because each cell is thus compelled to give six others the greatest amount of support; thus strength, economy of material, and economy of space and time are attained in the highest degree. The more salient groups of the *Pædotropha* are the *Apidæ*, *Andrenidæ*, *Vespidæ*, and *Formicidæ*. They are the most prominent at present for their habits and economy.

2. The *Creophaga*, which store up insects of all kinds as food for their young. They differ from the *Pædotropha* in abandoning their progeny, being satisfied that they will find out and appropriate the food provided for them. The food consists of spiders, grasshoppers, cockroaches, flies of all kinds, caterpillars, and occasionally the imagos of Lepidoptera. These creatures appear to be still living with the parent Creophagan, but to have been stung, and thus rendered numb and helpless. The stings of this order seem to possess the power of reducing the victim to a semi-torpid state, in which we may hope they remain without sensation; for from this time forward they have neither food, light, nor liberty, but remain in a perfectly helpless state, until required for the food of the Creophagan.

3. The *Biophaga*, or those which, in the larva state, are imprisoned in the bodies of living insects, on whose flesh they feed during the whole of their larval existence, until their victim is shrivelled and reduced to a mere skin, and yet retains a languid animation. The Biophagan may be supposed instinctively to avoid the vital parts of its prey, since, by destroying life, it would induce its own death; it is essential to the well-being of the Biophagan that its prey should retain life as long as its own life and appetite endured. It generally leaves its victim before life is entirely extinct, and, spinning its cocoon on the exterior, in due time undergoes its final change to lay its egg on another victim, and thus inaugurate another cycle of cruelty and rapine.

It is impossible to meditate on these details and not to rejoice in the belief that the victims of this treatment are not, like ourselves, sensitive to pain; indeed, there are many circumstances connected with the inquiry that lead to this conclusion: it would be horrible to suppose that millions upon millions of beings were annually born to feed parasites that are ever feeding on their living flesh.

From the observations in Kirby and Spence it will be seen that those far-seeing naturalists viewed this matter in an entirely different light; they simply regarded the phenomena from a utilitarian point of view. I will quote the passage entire, since it illustrates my theme, although I can by no means concur in the moral drawn from the facts. "From the observations hitherto made by entomologists the great body of the ichneumon tribe is principally employed in keeping within their proper limits the infinite host of lepidopterous larvæ, destroying, however, many insects of other orders; and perhaps if the larvæ of these last fell equally under our observation with those of the former we might discover that few exist uninfested by their appropriate parasite. Such is the activity and address of the Ichneumonidans, and their minute allies the ***Pupivora***, that scarcely any concealment, excepting perhaps the water, can secure their prey from them, and neither bulk, courage, nor ferocity, avail to terrify them from effecting their purpose. They attack the ruthless spider in his toils; they discover the retreat of the little bee that for safety bores deep into timber; and though its enemy Ichneumon cannot enter its cell, by means of her long ovipositor she reaches the helpless grub which its parent vainly thought secured from every foe, and deposits in it an egg, which produces a larva that destroys it. In vain does the destructive *Cecidomyia* of the wheat conceal its larvæ within the glumes that so closely cover the grain: three species of these minute benefactors, sent in mercy by Heaven, know how to introduce their eggs into them, thus preventing the mischief which they would otherwise occasion, and saving mankind from the horrors of famine. In vain also the ***Cynips***, by its magic touch, produces the curious excrescences on various trees and plants, called galls, for the nutriment and defence of its progeny. The parasite species attached to it discovers its secret chamber, pierces its wall, however thick, and commits the destroying egg to its offspring. Even the clover-weevil is not secure within the legumen of that plant, nor the wireworm in the earth, from their ichneumonidan foes. Others are not more secured by the repulsive nature of the substance they inhabit; for two species at least of Ichneumon know how to oviposit in stercorarious larvæ without soiling their wings or bodies."—'*Introduction to Entomology*,' i. 267.

I have named the group *Biophaga*, or life-eaters, because I thought that name more truthful, descriptive, and emphatic, than those hitherto employed,—*Entomophaga*, *Isophaga*, *Parasita*, *Ennivora*, *Pupivora*, *Pupophaga*, &c. The *Evaniidæ*, *Ichneumonidæ*, *Chalcididæ*, and *Proctrotrupidæ*, are generally esteemed the principal families of this order. This is a much more extensive group than is generally supposed. We are too apt to regard Ichneumons as a large tribe of insects associated from their propensity to live parasitically on the caterpillars of butterflies and moths; but this scarcely gives a sufficiently comprehensive idea of the phenomena. Prof. Westwood, in that vast repertory of entomological facts,—which requires an index,—'Introduction to the Modern Classification of Insects,' has collected from a variety of authentic sources a vast amount of information which widely extends our views of these Biophagans, and shows that scarcely an insect is secure from their attack. I will enumerate a few of these instances.

Octopoda.—Several spiders are subject to this plague: the beautifully silk-like egg-nests of many spiders are attacked in this way, and the eggs thus prevented from coming to maturity. Indeed one species of Biophagan is so well known for its ravages on the spider-world that it has received the name of *Ichneumon aranearum.**

Hexapoda.—In Lepidoptera the liability to parasites is the rule, its absence the exception. In Diptera I have observed the frequent occurrence of hyperparasitism, that is when the fly has deposited its egg on or in the larva of a Lepidopteron: the larva proceeding from that egg has become the prey of a Biophagan, and thus the original life has been forfeited; the life of the dipterous destroyer has also been forfeited; and the destroyer of the destroyer, or the hyperparasite, has been the only life to escape. As an example I may state the common woolly-bear, the larva of *Chelonia caja*, feeds a host of these Biophagans, not only direct parasites, or parasites which not only fulfil their murderous mission on the woolly-bear itself, but which nourished with their own living flesh hundreds of minute Biophagans; so that the bear and its parasites alike perish under the terrible infliction of these almost invisible murderers. Some even go farther than this: they pierce the eggs of Lepidoptera with their ovipositor, and fill these eggs with their ravenous progeny. In a word, this parasitism is so common among butterflies and moths that I know not a single species that escapes it altogether. *Papilio Machaon* perhaps offers the nearest approach to immunity, for I have never bred more than two parasites from this noble butterfly. The Hymenoptera themselves are subject to the attacks of numerous parasites. There is one group whose parasites are of another class: these are the *Pædotropha*, or those which live in vast communities. These are preyed upon exclusively, as I believe, by Coleoptera, the genus *Rhipiphorus* and *Zenos* attacking the *Vespidæ; Horia, Sitaris, Melöe, Stylops, Eleucus, Hylecthrus*, and *Halictophagus*, being parasitic on solitary species. These I have elsewhere described as having a metamorphotic larva: the first stage very slender, hexapod, and active; the second, obese, apod, and stationary. Most of the phytophagous Hymenoptera are subject to this plague: the common leathery cocoon of *Tenthredo cratægi*, often seen in abundance in our whitethorn hedges, is frequently stuffed to bursting with the larvæ of a Biophagan. In Coleoptera the instances of the parasitism of these Biophagans are by no means so numerous. *Timarcha tenebricosa* is subject to this plague, but never to any great extent. *Coccinella 7-punctata* has a similar enemy, and numerous *Rhynchophora* suffer from their attacks: the genera *Barynotus, Otiorhynchus*, and above all the quaint *Apions*, particularly *A. apricans*, the insect which I described elsewhere as so destructive to clover-seed. If you sweep the clover with a bag-net the proceeds will contain the *Apion* and a small *Pteromalus* in about equal numbers: and as for *Otiorhynchus sulcatus*, that inveterate enemy of green-house ferns; *O. notatus*, which infests the larch; and *O. scabrosus*, that plague of the rose grower—they are all subject to Biophagan assaults. So also are the various species of *Ptinidæ;* and these life-destroying creatures not only traverse our posts and rails, and fences and timber, out of doors, but enter our houses with the charitable intention of finding and destroying these boring creatures, while thinking themselves safe in their cylindrical galleries. The larvæ of *Mordellæ* and *Orchesiæ—Orchesia micans*—fall a prey to these parasites. On the Orthoptera the Biophagans make but little impression. The locusts which have devastated the Western States of America are infested by a Biophagan, but in such small numbers that it fails to make any impression on the multitudinous hosts of these destroyers. In Neuroptera a singular instance is given by Mr. Kirby of a minute Biophagan being found on *Æschna viatica;* and Boudier has discovered one that attacks the ant-lion in his pitfall. This appears the most extraordinary instance of all. The ant-lion constructs its pitfall for the sole purpose of entrapping wandering and unwary flies that may chance to venture too near the brink of the treacherous precipice prepared for their destruction: and here we see a powerless insect boldly bearding the lion in his den; and by the insidious process of puncturing and depositing an egg that will hatch within his body and produce a grub that will, by slow degrees, consume his living flesh, avenging a whole legion of flies which have fallen victims to his rapacity. This is the most remarkable instance of all; and here I will draw the curtain over the harrowing scene.

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* *Ichneumon aranearum*, Fourc., is *Pezomachus zonatus*, Först.

Still another feature must be added to this sad story, that of eggs and egg-setting. Many of these *Biophaga* are so minute that they are born and pass through the state of egg, caterpillar, chrysalis, and imago, within the egg of a butterfly or moth. I have been told that hundreds of these minute creatures have been seen to issue from a single egg. Perhaps it was in reference to these wonders that Cowper wrote:—

> "The shapely limb and lubricated joint
> Within the small dimensions of a point,
> Muscle and nerve miraculously spun
> His mighty work, who speaks and it is done."

4. The *Phytophaga*, which in the larval state feed entirely on plants. The families are *Tenthredinidæ, Xyelidæ, Siricidæ,* and *Cynipidæ.* Since it is compulsory that I should enter more fully into the details of this order in a future portion of this paper, I will not introduce them here. It is quite certain that as our philosophical knowledge of the *Hymenoptera* progresses, many, perhaps all, of the groups which I have called families will take the rank of natural orders.

Although the characters by which this plant-eating tribe seem so trenchant as to admit of neither difficulty nor confusion, yet we shall see that it is so comprehensive as to require subdivision within its own compass. Thus some may be denominated *Phyllophaga,* or leaf-eaters, from their larvæ eating the leaves only; others, *Myelophaga,* from a similar preference for the pith; a third order, *Xylophaga,* devour the solid wood; and a fourth have the singular economy of setting up a diseased action locally in the plant, and eat nothing but the abnormal productions which their attack has occasioned,—these are the *Nosophaga,* or *Cynipites.* To the last of these belong the sawflies, a group of insects that seem isolated in a very remarkable manner, so much so indeed that our more philosophic and systematic entomologists exclude them from the Hymenoptera altogether. In the larva state they resemble Lepidoptera, in the pupa state they assimilate to Coleoptera, and the perfect insect is a complete Hymenopteron, possessed of most of the distinctive characters in a very marked degree, the wings being also extended.

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. Kirby,
Assistant-Naturalist in Museum of Science and Art, Dublin.

No. IX. NYMPHALIDÆ—HELICONINÆ.

In structure the butterflies of this subfamily resemble the *Acræinæ*, and their larvæ are also spiny, but the palpi of the imago are clothed with fine scales, and hairy in front. Their closed wing-cells will prevent their being confounded with the typical *Nymphalinæ*, and their very long rounded wings separate them at a glance from nearly all other butterflies, except the *Danainæ*, which some of them mimic, but from which the simple submedian nervure of the fore wings will distinguish them. The subfamily, as at present constituted, includes but two genera, *Heliconius* and *Eueides*, the former of which may be known by its longer and slenderer antennæ, with a much more gradually formed club. All the species are tropical American.

The first section of *Heliconius* comprises black and fulvous species, spotted or banded with yellow, and frequently resembling *Tithorea*, *Lycorea*, *Melinæa*, &c., in markings. Some of these, such as *H. Eucrate*, have a conspicuous white spot in the broadly black tip of the fore wings. Another section is black, or bluish black, variously banded with white or yellow. Thus *H. Antiochus* has two narrow white bands on the fore wings; *H. Diotrephes* a very broad one; *H. Cydno* a broad yellow one on the fore wings, and a submarginal white band on the hind wings; and *H. Rhea*, and allies, a broad yellow band on the fore wings, and a narrower one towards the tip.

H. Charithonia, the commonest species in the West Indies, has two narrow yellow bands across the tip of the fore wings, and another running from the base, and curving at about half its length towards the hinder angle, to which it nearly extends. There is a basal stripe on the hind wings, and an outer continuous row of spots. In *H. Atthis* the hind wings are similarly marked, but the outer spots are milk-white, and there is a short yellow basal stripe, with a broader transverse one at the extremity, beyond which are one or two white spots, and an outer row corresponding to that on the fore wings. I know of no genus which presents a greater variety, combined with so much uniformity, of both colour, marking, and pattern, as *Heliconius.*

One of the prettiest species is *H. Cyrbia*, which is dark blue, with a red transverse band on the fore wings, and the border of the hind wings spotted with white. A great number of the commonest and best-known species are black, red, and yellow. *H. Clysonymus* has an irregular transverse yellow band on the fore wings, and a broad red band on the hind wings. In *H. Phyllis*, and its allies, these colours are reversed, there being a red band on the fore wings and a yellow one on the hind wings, and sometimes a yellow basal streak on the fore wings also. *H. Erate* is remarkable for appearing under two forms in both sexes, which were naturally supposed to be two species, till Mr. Bates reared them both from the same larva. In both there is a large transverse cluster of yellow spots in the middle of the fore wings, and a band of four or five large spots across the tip; but in typical *Erate* the hind wings are rayed with red; and in *Doris* with greenish blue. Some forms, allied to *Melpomene*, in which there is a large red stripe across the fore wings, are marked with red only, being more or less banded, spotted, or rayed, on the fore or hind wings, or both; and *H. Thelxiope* is rayed with red on all the wings, but more or less spotted with yellow beyond the middle of the fore wings. *H. Ricini*, a species somewhat approaching *Eueides*, has a yellow band on the middle of the fore wings, and a smaller one towards the tip; the hind wings are red, with a broad black border.

The species of *Heliconius* measure from two to four inches in expanse; but those of *Eueides*, which, as we have said, may be known by the difference in their antennæ, rarely exceed two inches and a half. They are generally black and tawny, varied with dull yellow. The first group resembles *Heliconius Thelxiope* and allies, being black, veined with dull red, and spotted with dull yellow beyond, instead of sulphur-yellow. *E. Thales* may be considered as the representative of this group. Another group, of which *E. Lybia* may be considered typical, is fulvous, with the borders broadly black, and a broad black band towards the tip of the fore wings. In *E. Olympia* the tip is broadly black, with a large white spot. In the last group, comprising *E. Cleobæa*, &c., which sometimes measures three inches across the wings, the species are banded and spotted with black and tawny, and with ochre-yellow beyond the middle of the fore wings, nearly as in *Lycorea* or *Melinæa*.

Fritz Müller has lately proposed to introduce the genera *Colænis* and *Dione* into the *Heliconinæ*, considering that their resemblance to *Heliconius* and *Eueides* is so great, both in structure, habits, and transformations, that the difference in the wing-cells ought not to be considered; but I do not wish to disturb the usual arrangement in the present series of papers.

(The present paper has been accidentally transposed; it should have preceded the first paper on *Nymphalinæ*.)

ICHNEUMONS.*

By Edward A. Fitch.

"The most formidable difficulty in the way of the investigation of some of what I have called the 'neglected orders,' is the want of accessible handbooks." So says Dr. Parsons in a paper, on the general study of Natural History, read before the Selby Naturalist's Society (see the 'Naturalist,' December, 1877, and January, 1878). This paper contains many worthy hints, which deserve to be borne in mind and acted upon by entomologists especially, and sets forth many important truisms. The study of the terebrant Hymenoptera has been greatly retarded in Britain by the want of accessible handbooks. However we have one now in course of publication which will certainly be a great help to the student of the entomophagous section of this interesting class of insects. The author has also been the elucidator of the life-histories of the phytophagous sawflies, many of which have been translated into the pages of the 'Zoologist' and 'Entomologist.'

Of the neglected Ichneumonidæ we have, thanks to Mr. Marshall, an excellent catalogue; but I believe there is by no means a representative private collection in Britain. Mr. Desvignes's is now located in the British Museum, which also contains the general collection of Dr. Reuter. Mr. F. Walker's was the hard work of a life-time, but unfortunately would have required another life's work to have made it of use; the number of specimens was large, and many interesting, but it lacked all system or arrangement.

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* 'Pinacographia.' Illustrations of more than 1000 species of North-west European Ichneumonidæ sensu Linnæano. Parts 1—6, quarto. Martin Nijhoff, The Hague, 1875 *et seq.*

There are but few entomologists who do not know these insects, many certainly with dislike; but the few who have wished for a better knowledge of the families, and the truly wonderful economy of the species, have been deterred for the want of an instructor. This is to be deplored, as from their parasitism many species will necessarily remain extremely local, though perhaps not rare, and the economy of others, for lack of the determination of the species, remains unrecorded. Some years ago the fine *Arotes albicinctus* was considered a very rare insect. When the indefatigable Mr. F. Smith was at Mr. Stephens's, on one of his memorable Wednesday evenings, conversation turned on this insect. Mr. Stephens described the very oak tree, in a lane near Darenth Wood, on which he had captured the species. Mr. Smith journeyed to "Darn," sought out the described tree, and there on its trunk was *Arotes* waiting for him. A fine instance of the value of locality. Till use is made of the opportunities which continually offer for the classification of these facts, the progress in the study must be small. Few are preserved, and these seldom to a good purpose. The whole proceedings with these parasites, continually being bred from insects of all orders, show nothing but neglect: that this has been the case is particularly observable. Since my remarks last December I have received three small parcels of Ichneumons, and curiously enough each has contained a species new at least to Britain: this shows how much is to be done. With bred specimens a knowledge of the economy of both the preyer and the preyed upon cannot fail to lead to important results: this has also been greatly neglected. Mr. F. Bond, during his long experience, acquired a considerable collection of the lepidopterous parasites, each specimen being labelled with information as to its parasitism. These he gave to the late Mr. Desvignes, who, although a very talented entomologist, was unfortunately a systematist; and on acquiring this interesting collection his first action was to remove the disfiguring labels, and so destroy its essential value.

Another fact militating against the scientific study of the Ichneumonidæ and allied families has been the involved synonymy, this owing to the writings of the various authors being so scattered that many were unknown the one to the other; further than this the same insect is repeatedly described under different names, and different insects under the same name,—this even by the same author. The difficulties created by this latter fact made the following of Walker in the *Chalcididæ* seem to me almost a hopeless task. Vollenhoven's beautiful figures will serve as a starting point to remedy much of this. An instance:—I happened to take Part VI. to the British Museum; on looking through it Mr. F. Smith at once detected an apparent error. Plate 30 beautifully illustrates the three first genera of the *Chalcididæ;* fig. 1 was named *Smicra sispes*, L. Here was the confusion: the species with yellow femora was discovered by the late Mr. F. Walker to be parasitic on the curious larva of the *Stratiomydæ*, from which it was also bred by Mr. Smith, and was generally known as *S. sispes*. To prove this the National Collection was examined; this quite corroborated Mr. Smith's opinion. Van Vollenhoven's species was the one with red femora. To prove him wrong Fabricius was referred to, and there we find—"C. nigra abdominis petiolo femoribusque posticis incrassatis *flavis;*" but to make doubly sure we went back to Linné, and there sure enough was "*rufis*." Thus, through Fabricius's careless copying, error was perpetuated, at least in Britain.

The fourteen plates of the 'Schetsen,' published some ten years ago, were a valuable aid to the study of the Hymenoptera: what Meigen did for the Diptera, Van Vollenhoven wished to do for the Hymenoptera. 'Pinacographia' is a continuation of this venture on a larger and more elaborate scale: the work is published at the Hague in parts, which appear at irregular intervals; six have already appeared. Each part contains eight pages of letterpress and five coloured plates; the price is 3.50 fl. (about seven shillings English) per part. The text is printed in parallel columns in Dutch and English, which is intelligible, if not good: this part of the work is undoubtedly poor and superficial as far as it at present goes, but better things are promised. "Of course the text is a matter of secondary importance, and will only contain the explanation of the plates, diagnoses and short descriptions of new species, with analytical tables, and some remarks on Biology. Meanwhile it may be possible that the drawing of such a number of figures will procure me so much knowledge of the relationship of the different genera that I may be induced at the end of this work to give a general systematical review of the families examined." This is from the Introduction; and if the tables of species and tables of parasitism, which are promised, be given it may be made a complete work. Much of Ratzeburg's information needs revision. Too much cannot be said in praise of the extreme excellence and beauty of the plates: they are so absolutely correct both in colour, delineation of the structural details and general excellence of production, that it must be almost impossible to fail to recognise the species at once. They are all drawn by Snellen van Vollenhoven himself, and most carefully engraved by A. J. Wendel. With these figures at hand it can be by no means difficult to work out to a fuller understanding of the genera the descriptive works of Gravenhorst, Förster, and Thomson, or the scattered papers of our own Haliday and Walker in the smaller species. 'Pinacographia' treats of the *Ichneumonidæ* in the Linnean sense, and so includes most of the parasitic Hymenoptera, *viz.*, the *Ichneumonidæ*, the *Braconidæ*, the *Proctotrupidæ* (*Oxyura*), and the *Chalcididæ*. A synopsis of the various genera has already been translated into English;* and it is to be hoped the appearance of the work now under notice, if carried to completion, will materially help to the filling in of this large framework. Although printed in English I believe there are something less than half a score copies of this beautiful work find their way into Britain; this I can but think is because it is not better known. For an acquantance with Ichneumons generally there is certainly nothing to equal it.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

NOTES FROM GUERNSEY.—Through illness and other causes I have been prevented from doing much in Entomology during the past two years. I am, however, pleased to record two additions to my list of Macro-Lepidoptera inhabiting these islands, *viz.*—a specimen of ***Ephyra punctata***, captured by a lady in her garden, St. Peter-Port, Guernsey; and one ***Xanthia silago***, taken at sugar, by the Rev. G. H. Engleheart, in Sark, during September, 1874, and accidentally omitted from my list. Last year I had a splendid specimen of ***Argynnis Lathonia*** brought to me. From its condition it had evidently just emerged from the chrysalis. A larva found feeding in the seed-head of an Indian pink turned out to be the common ***Dianthœcia capsincola***. ***Colias Edusa*** was very abundant last year all over the islands: in clover and lucerne fields they actually swarmed; and were as common in gardens as the ***Pieridæ*** in ordinary seasons.—W. A. LUFF; Guernsey.

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* "Translation of Synoptical Arrangements of some European families and genera of Hymenoptera," by Francis Walker: London, E. W. Janson, 1874; price 1*s*. "Notes on Chalcidiæ," by Francis Walker: London, E. W. Janson, 1871, 1872; Parts I.—VII.; price 6*d*. each. "Notes on the Mymaridæ," by Francis Walker: the 'Entomologist,' October, 1873; price 1*s*. "Notes on the Oxyura," by Francis Walker: the 'Entomologist,' November, 1873; January, 1874; February, 1874; price 6*d*. each.

ACHERONTIA ATROPOS IN THE COUNTY CORK.—A specimen of this moth made its appearance, and was captured at Schull, on the evening of June 8th, at 9.30. It flew into the drawing-room of the house in which it was taken, and attracted attention by the heavy flapping of its wings against the windows. It "cried" frequently while it was being caught, and afterwards.—W. W. FLEMYNG; The Vicarage, Glengariff, co. Cork, June 17, 1878.

FOOD OF ACHERONTIA ATROPOS.—On August 6th, 1877, I found a larva of *Acherontia Atropos* feeding upon the spindle tree (*Euonymus Europæus*). Is not this of rare occurrence?—FRED. ENOCK; 30, Russell Road, N.

CHŒROCAMPA CELERIO AT ALDERLEY EDGE.—While standing near an azalea tree in full bloom, on May 24th last, I captured a specimen of *Chœrocampa celerio*. It is a little rubbed upon its thorax, but is otherwise in good condition.—WM. W. KEYWORTH; Alderley Edge, near Manchester, May 25, 1878.

STAUROPUS FAGI.—On the evening of June 5th I had the pleasure of taking a fine male example of this somewhat scarce insect, on the trunk of a fir tree, in Knowle Park, Sevenoaks. It was in beautiful condition, and had apparently never flown.—C. J. BIGGS; South Hackney, June 18, 1878.

ACRONYCTA ALNI BRED.—The larva of *Acronycta alni*, recorded in the 'Entomologist' by me in 1877, produced a perfect specimen on the 27th May this year.—T. H. TAYLOR; George Street, Wakefield.

A TORTRIX NEW TO BRITAIN (PENTHINA POSTREMANA).—Last autumn, having nothing else to do, I was sitting on an old stump looking at the peculiar jointed stems of the balsam (*Impatiens noli-me-tangere*); I fortunately split one open, and found a larva, of a dirty whitish colour and a dark black head, ensconced snugly inside. Seeing it was a Tortrix larva, and in such a rare plant, I spent three days hunting them. The result has been, on May 4th last, I bred two specimens of the very handsome *Penthina postremana*. Since then I have bred three more specimens. I sent one to Mr. C. G. Barrett for examination, and he has identified it for me. Prior to that Mr. Stainton had written me there were only two Tortrices known to feed in the stems of the balsam on the Continent, viz., *Penthina fuligana* and *P. postremana*. Luckily it is the new one, although the former is still a rare species.—J. B. HODGKINSON; 15, Spring Bank, Preston, May 26, 1878.

REVIEW.

The Transactions of the Entomological Society of London for the year 1877.

THE volume for 1877, although not quite so bulky as its predecessor, certainly cannot be said to be far below it in interest, more especially to the student of British or applied Entomology apart from the descriptive, though much of this interest will perhaps centre in the Proceedings. In the number of memoirs which it contains it exceeds the volumes for both 1875 and 1876, and is the same as that for 1874. Of the twenty-eight separate papers fifteen are purely descriptive, and four are revisions or monographs of certain special families. Of the remaining nine, five are of more or less general interest, and four only can be said to come within the range of the observing and general entomologist; still, as the custom is, this must be looked upon as a fair average.

For four, out of the above-mentioned five, memoirs our thanks are due to the President, Prof. Westwood. They are entitled:—"Notes upon a Strepsipterous Insect parasitic on an Exotic species of Homoptera;" "Notes on the genus *Prosopistoma* of Latreille;" "Entomological Notes;" and "On the adult Larvæ of the *Stylopidæ* and their Puparia," which is by Sir Sidney Saunders, with further remarks and figures by the Professor. These observations are supplementary to the first paper on the Stylopoid parasite of the Borneon Homopteron. The fifth of these memoirs is a "Note on *Mygale stridulans*," by Prof. James Wood-Mason, which contains a graphic and detailed description, from the pen of Mr. Peal, of the way in which this spider stridulates; it is also accompanied by a capital plate. Prof. Westwood's "Entomological Notes" are (1) on the pupa of a trichopterous insect (*Anabolia nervosa*), which swam about in water like a *Notonecta*, with some remarks on its structure and habits; (2) on the parasitism of certain lepidopterous insects, which contains observations on a lepidopterous larva captured in South India clinging to the abdomen of an Homopteron; Prof. Westwood thought it an instance of true parasitism, but Mr. Wood-Mason, the original owner of the specimens, inclined to the opinion that the larva was the messmate, rather than the parasite, of the Homopteron; (3) on the lepidopterous genera *Himantopterus*, Wesmael, and *Thymara*, E. Doubleday. The former of these (the unique specimen of which is in the Brussels Museum) was transferred by Dr. Hagen to the Neuroptera; it is here relegated to the Lepidoptera, as an ally of *Thymara*, in which class it was originally described by Wesmael.

The four memoirs which may be looked upon as of more general, if of less scientific, interest, are Mr. Distant's paper on "The Geographical Distribution of *Danais Archippus*;" Mr. J. W. Slater's two papers on "The Food of Gaily-coloured Caterpillars," and his "Vivarium Notes on some common Coleoptera;" together with another of Mr. Mansel Weale's highly interesting papers on "The variation of Rhopalocerous forms in South Africa." This latter paper is thus summarised in the Proceedings:—

> "The author, after stating that he had travelled over most of the eastern districts of the Cape Colony, alluded to the distribution of plants as affecting that of insects, and noticed the apparent encroachments of the subtropical flora and insect fauna along the south-eastern seaboard, the absence of any great barriers, and the general uniformity tending to produce close variations. He exhibited and remarked on a large series of *Papilio merope*, male and female, some reared by him, and all collected in one small wooded gully, isolated in an open grass country. He also exhibited male and female *Nymphales xiphares* (*Thyestes*), the male of which is wanting in the National Collection, remarking on the apparent imitation by the female of *Amauris echeria*. He next exhibited and remarked on a series of imagines of *Acræa esetria*, some of the forms of which are separated by some entomologists, and stated that all the forms had been reared from larvæ collected on a single plant. He next exhibited a series of *Junonia pelasgis* and *J. archesia*, showing a very close gradation linking the two forms, and showed that some of the latter approached *J. amestris*, although the alliance was not so evident as in *J. pelasgis*. He objected to the use of the name "species" as too freely used among plants and insects, and suggested that it merely implied a

provisionally uncertain distinction of apparently important differences. In illustration of this he exhibited specimens of *Callosune evarne* and *C. keiskamma*, two forms hitherto held distinct, but of which the ova, larvæ, and pupæ exhibited no differences, although in two broods in successive years the forms appeared separately. He also remarked on artificially produced changes in the pupæ."—P. xiv.

Mr. Slater's first paper contains some interesting facts upon the food and protection of certain lepidopterous larvæ, presumably with a view to prove that there is a connection between "conspicuous coloration and a poisonous or offensive food-plant." His notes on Coleoptera refer to the habits of several well-known species, many interesting facts being spoken to from direct observation: an important one is that the *Telephori*, from their pugnacity, so well known as "soldiers" and "sailors," are diligent devourers of *Aphides;* and Mr. Slater goes so far as to say that "In this respect I should think that they are more serviceable to the farmer and gardener than the ladybirds, being more voracious, more active, and, on the average, more numerous."

Mr. Distant's memoir is a rather elaborate paper on "The means of Dispersal and Conditions which are favourable to the Survival in a New Habitat," of Lepidoptera in general, with especial reference to *D. Archippus* in particular. Three or more specimens having occurred in Britain in the autumn of 1876, it is not unlikely that before long this species may gain a permanent settlement here, as it has done in many other lands, notably in Australia.

In the Proceedings, which, together with the President's Address, index, &c., extend to ninety-three pages, there is much to interest all. Numerous specimens, consisting mostly of varieties and monstrosities of Lepidoptera, and new or interesting species of other classes, were exhibited at the Society's meetings: these are all specially referred to. Some valuable communications on stridulation and mimicry were brought forward by Prof. Wood-Mason and others. Our notice is already long, but the following three extracts may be new and of interest to many of our readers:—

Season-dimorphism in Lepidoptera.—"The President read some interesting remarks from a letter he had received from Mr. B. G. Cole respecting some specimens of *Ephyra punctaria* which he had bred from eggs laid by the same female, the greater number of which emerged from the pupæ in July (as the spotted variety), while the remainder appeared in May, in all respects resembling the mother. He repeated the experiment in 1876 with similar results; all but one pupa from a batch of eggs laid in May appeared in July as the spotted form (males and females), the single exception remaining still in pupa, which it was presumed would appear during the coming May in the vernal dress. In this latter case he had reared a second brood of larvæ from eggs laid by some of the July females, all of which were now in the chrysalis state. Mr. Cole added:—'May not the above be considered a case of "season-dimorphism" analogous to that occurring in *Pieris*, *Araschnia*, *Selenia*, &c., as investigated by Dr. Weismann, a slow process of development during the winter being necessary for the May form (which may be considered the type), whilst if the development of the pupa is hastened by the heat (and light?) of summer, the smaller and less perfect individuals are the result? Referring to the similar case of *Selenia illustraria*, Dr. Knaggs (Ent. Mo. Mag. iii. 238) remarks as follows:—"It is pretty well known that in the natural sequence *S. illustraria* reproduces itself in the form of *S. delunaria*, and *vice versâ*. But what I assert is, that whenever (whether at large, owing to exceptionally hot or long summer seasons, or in captivity from warmth, assisted perhaps by what Mr. Crewe has happily termed 'feeding up quickly') the completion of the pupal stage is accelerated, then *S. delunaria* produces *delunaria*, not *illustraria*. Further, it is my belief that the converse will be found to hold good, *viz.*, that should the completion of the pupal stage be retarded either by cold seasons or climates in a state of nature, or artificially by aid of an ice-well, *S. illustraria*, not *S. delunaria*, would be found to result from *S. illustraria*." And again (*loc. cit.*, p. 256) he puts it thus:—"If *I.* = *illustraria*, *D.* = *delunaria*, and — = winter; then if there be but one brood in the year the sequence will be *I.* — *I.* —*I.*, and so on: if two broods, *I. D.* — *I. D.* — *I. D.*, and so on; if three broods, *I. D. D.* — *I. D. D.*, and so on." I have not yet tried the effect of artificial retardation on the pupæ of *Ephyra*, but intend to do so when opportunity offers. My experiment shows that the effect of natural retardation over the winter months is to produce the type whatever may be the form of the parents; and that such natural retardation does usually (? always) occur in double-brooded species I believe to be true from my experience in breeding various insects. Remembering that the summer broods of season-dimorphic species are smaller, and apparently vitally weaker than the spring ones, and that it is from the former that the latter are usually descended, may we not assume that the provision by which some few of the direct offspring of the spring forms are preserved through the winter in the pupal state, and so are enabled to pair with the offspring of the summer form, is of advantage to the species, in affording a "cross" between individuals which have developed under very different conditions? A similar benefit may be derived in the commonly observed case of individual pupæ of single-brooded moths (*e. g.*, *Eriogaster* and many *Notodontidæ*) remaining two, three, or more years in that stage, and then eventually making their appearance at the proper season with the ordinary flight of the species. As bearing on the above suggestion, I may refer to what occurs in those single-brooded moths (*Sphinx Convolvuli*, *Acherontia Atropos*, &c.), which sometimes appear abnormally from the pupa before the winter hybernation, or which by "forcing" have been artificially so developed. It has been stated, I believe, in most such cases in which an anatomical examination has been made, that the ovaries, &c., were found in an abortive or rudimentary condition. This goes to show that a long period of quiescence is necessary to perfect these delicate and highly specialised organs, and by a parity of reasoning it may perhaps be assumed that those pupæ which remain longest in that stage will (*ceteris paribus*) produce the most highly developed and vitalised imagos.'"—Pp. vi, vii.

Pickles.—"Mr. Douglas, who was unable to be present at the meeting, had forwarded to Mr. Jenner Weir a letter he had received from Mr. R. A. Ogilvie, enclosing specimens of an insect found in great quantities in a jar of pickles (piccalilly). They confined their attacks to the pieces of cauliflower in the jar, which they appeared to relish, notwithstanding the vinegar, mustard, pepper, &c., in the pickles. The species had been submitted to Prof. Westwood, who replied that 'the flies were the common *Drosophila cellaris*, with their curious two-horned pupæ; and they frequent cellars and cupboards, delighting in stale beer, wine, &c.' He supposed that 'the cauliflowers were more to their taste than the other things in the jar, being more succulent and flabby.' In answer to a question put by Mr. Ogilvie, he said that the eggs were laid in the pickle-jar, and not in the vegetables before they were pickled."—P. xv.

Dermestes ravages.—"Mr. W. L. Distant exhibited a specimen of the ravages of *Dermestes vulpinus* (Fab.) in a cargo of dried hides from China. On the arrival of the hides in this country they were found to be infested and gnawed into holes by swarms of the insect in their different stages, causing a damage of from fifteen to twenty per cent. on the value of the cargo. It is not unusual to see this well-known insect amongst these articles, but quite unprecedented to find it in such numbers and causing such an amount of damage. In fact, its appearance had quite paralysed the importation of the hides, and gave further proof of the value of Economic Entomology in the arts and manufactures. Mr. M'Lachlan exhibited a portion of a wooden case containing hides from Shanghai, which was riddled with borings of the larvæ of this beetle."—P. xxii.

At the Annual Meeting in January last a satisfactory report was received from the Council, and the President, Prof. Westwood, read his Address, which gave a general *resumé* of the entomological work accomplished in the past year. The following officers and council were elected for 1878:—President, H. W. Bates; Treasurer, J. Jenner Weir; Secretaries, R. Meldola and W. L. Distant; Librarian, F. Grut; other members of Council, G. C. Champion, J. W. Douglas, Rev. A. E. Eaton, E. A. Fitch, G. Lewis, E. Saunders, F. Smith, and Prof. J. O. Westwood.

OBITUARY.

William Chapman Hewitson.—Born at Newcastle-upon-Tyne, on the 9th January, 1806; died at Oatlands, Walton-on-Thames, on the 28th May, 1878.

Educated at York, and brought up as a land surveyor, the early days of railway enterprise found Hewitson at work under George Stephenson; and he was for some time engaged on the London and Birmingham Railway. But delicate health and the possession of competent means combined to induce him to abandon active employment of this nature. Leaving his northern home he resided for a time at Bristol, thence moved to Hampstead; and finally, in 1848, he purchased some ten or twelve acres of Oatlands Park, and built the house in which his last thirty years were spent. He joined the Entomological Society in 1846, the Zoological in 1859, and the Linnean in 1862.

In early life he collected British Coleoptera and Lepidoptera, and his name is not unfrequently mentioned in Stephens's Illustrations; but for some years he devoted his attention principally to the study of birds' eggs; and in 1833 he made a trip to Norway to discover the breeding places of some of our migratory species. A few notes from his pen on the Ornithology of Norway will be found in the second volume of Jardine's 'Magazine of Zoology;' and other notes on ornithological or oological subjects appeared from time to time in the 'Ibis,' the 'Zoologist,' and other periodicals. But in this branch of Science, as afterwards in Entomology, it was by his pencil and brush, rather than his pen, that he achieved distinction; and for accuracy of delineation and careful colouring of the eggs his 'British Oology' has never been surpassed.

The earliest of Hewitson's entomological notes was on the economy of *Hedychrum* (*Chrysididæ*), and appeared in the 'Entomological Magazine' for 1837. In the summer of 1845 he made an excursion in the Alps, and the result was some "Remarks on the Butterflies of Switzerland" (Zool. iii. 991). From the time of his settling near London, with the facility he thereby acquired for studying foreign species, his passion for Diurnal Lepidoptera developed itself, and he may be said to have devoted the rest of his life to the description and figuring of species of exotic butterflies.

It is needless to say that Doubleday and Westwood's magnificent work, 'The Genera of Diurnal Lepidoptera' (2 vols., folio, 1846—52), was illustrated by Hewitson. This was followed by 'Illustrations of Exotic Butterflies' (5 vols., quarto, 1852—77); "a twenty-five years' labour of love," as he himself described it, whilst regretting that age and failing health warned him to bring it to a close. In 1862 there appeared a specimen of a 'Catalogue of Lycænidæ in the British Museum,' containing eight plates of *Ogyris* and *Amblypodia;* but the Trustees declined to continue the work according to Hewitson's plan, and he commenced, under the title of 'Illustrations of Diurnal Lepidoptera,' a series of plates of *Lycænidæ*, of which seven parts appeared between 1863 and 1877, the eighth and concluding part being in preparation at the time of his death.

Besides the descriptive letterpress which accompanied these illustrations, Hewitson published numerous memoirs in the 'Zoologist,' the 'Annals and Magazine of Natural History,' the 'Journal of Entomology,' the 'Entomologist's Monthly Magazine,' the 'Proceedings of the Zoological Society,' the 'Journal of the Linnean Society,' the 'Transactions of the Entomological Society;' and in 1869 and 1870 he published as a separate work, 'Equatorial Lepidoptera collected by Mr. Buckley.' With few and slight exceptions (*e.g.*, Proc. Ent. Soc., 1856, p. ii., 1866, p. xxxv.; Trans. Ent. Soc., 1868, p. 97; Ent. Mo. Mag., vi. 96, ix. 161) these papers were simply descriptions of new species, many of which were afterwards figured in the works to which reference has already been made. The list concludes with 'Descriptions of four New Species of Pronophila,' which appeared (Ent. Mo. Mag., xiv. 227) so recently as March of the present year.

Hewitson married some thirty years ago, but was soon left a widower and childless. His health compelled him to lead a quiet and secluded life; and thenceforward his sole delight lay in beautifying his grounds at Oatlands, and in adding to his cabinets of butterflies. His ample means enabled him to indulge his tastes without stint. Gathered from all quarters of the globe, brought home by naturalists often sent out for the very purpose, the specimens selected regardless of cost, arranged with scrupulous neatness, and stored in cabinets of superb solidity,—Hewitson's collection of Diurnal Lepidoptera was such as no other man had formed, such probably as no museum ever possessed. Together with some choice pictures and water-colours, and some valuable cases of stuffed birds, he has left it to the nation; and it is presumed that this magnificent and unique collection of *Rhopalocera* will find a permanent and fitting home in the National Museum.

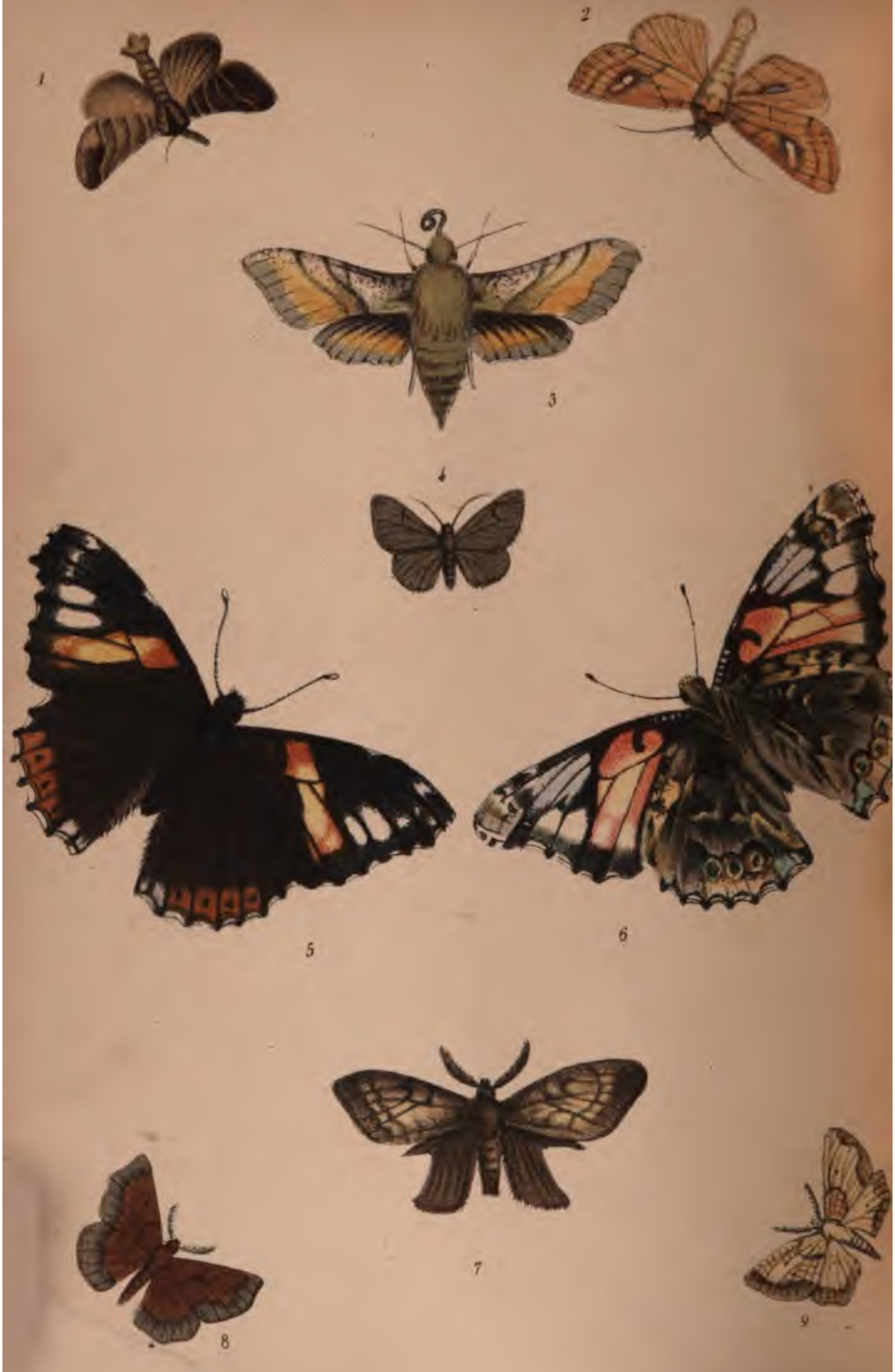
His library of works on Natural History, with a legacy of £3000, he has left to the Natural History Society of his native town; and the bulk of his considerable fortune is bequeathed to various charities and in legacies to his numerous friends.

His weak health and the seclusion of his life may perhaps have created what to strangers would appear a tinge of sourness in his disposition; whilst a natural slowness to accept new ideas may have led others to impute to him some degree of narrow-mindedness. But in truth he was of a gentle, kindly, and generous nature; and those who knew him best will most deeply mourn his loss. If not a great man, he was at least a good one.

But it is rather with the entomologist than the man that we have here to deal. It cannot indeed be said of Hewitson that he exhibited any breadth of view in scientific matters, or did much to advance the philosophy of Natural History, or to increase our knowledge of the economy even of his favourite group. Confining himself exclusively to a single section of a single order of insects, his writings contain little on the habits of the *Rhopalocera* he figured, little on classification or distribution, little on any of the interesting questions and speculations that give life and charm to Natural Science of the modern school. For these reasons he cannot be placed in the front rank of entomologists; and in truth he never aimed to be more than a describer and faithful depicter of species discovered by others. He was a great lover of Nature and of the beauties of natural scenery, yet he was emphatically a student of the cabinet. His figures, admirable as they are, are the figures of so many butterflies taken out of a drawer,—all wings, set out with provoking uniformity, no leg or palpus visible, no details of structure, without any idea of life: they seem to tell their own tale that they were painted by one who had never seen them in their native haunts, who knew them only as cabinet specimens. But in spite of this want of animation, in his own line as a pictorial describer of butterflies Hewitson stands unrivalled; and whether we look to the folio plates of the Genera, or the quarto illustrations of Exotic Butterflies and of the *Lycænidæ*, he is fairly entitled to the highest praise, as well for the accuracy and carefulness of his work, and the excellence and beauty of his colouring, as for the patient perseverance with which, for more than thirty years, he followed out his plans.

His epitaph must stand—"PAPILIONUM PICTOR, ET PICTOR PRÆCELLENS."

J. W. DUNNING.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THE ENTOMOLOGIST.

VOL. XI.] AUGUST, 1878. [No. 183.

VARIETIES OF LEPIDOPTERA AT THE NATIONAL ENTOMOLOGICAL EXHIBITION.

THE Editors of the 'Entomologist,' wishing to commemorate the first National Entomological Exhibition, have with this number presented the subscribers with a Plate of some of the most interesting aberrations of Lepidoptera exhibited on that occasion. The following are short descriptions of the specimens figured:—

No. 1. *Clostera curtula.*—The specimen figured is a hermaphrodite; the right side having the ordinary coloration of the female, and the left that of a rare variety of the male. This singular insect was, and is now, in the cabinet of A. B. Farn, Esq. Unfortunately, while this specimen was being drawn for the accompanying plate, the antennæ were accidentally broken off; but they were here depicted before this misfortune happened.

No. 2. *Leucania conigera.*—This insect has the normal coloration of the upper wings; but the left lower wing is both in structure and colour partly like the upper wings, and also has one white spot in the centre. The insect was captured by Mr. W. P. Smith, while mothing, in July, 1877, in Clatter House Lane (near the Welsh Harp), Middlesex.

No. 3. *Chœrocampa porcellus.*—A very pale aberration, in which all the rosy crimson of the species is replaced by yellow, and the coloration much subdued. The insect is in the cabinet of Sir Thomas Moncrieffe, and was captured at Moncrieffe by the owner. This specimen is in beautiful condition, and was at the time of capture evidently fresh from the pupa.

No. 4.—This is probably a melanic variety of an *Eupithecia;* it has the ordinary appearance of the species so obscured that, although the figure is correctly executed, it is quite impossible to recognise the species. The specimen figured, which is in the cabinet of Mr. W. Prest, of York, was bred by that gentleman from among a number of larvæ of *Eupitheciæ* taken at Bishop's Wood, Selby, Yorkshire. He states that he rears one or two of this curious form each season, from amongst larvæ of *E. albipunctata*, all collected in a like manner in the same large wood. Mr. Prest has named this variety or species, whichever it may turn out to be, *Eupithecia angelicata*, from the *Angelica sylvestris*, on the seeds of which plant the larvæ are found feeding.

Nos. 5 and 6. *Vanessa Atalanta.*—The upper and under sides of this aberration are both figured; the scarlet markings of the upper side of the anterior wings are partially suffused with yellow, and the white spots towards the apex are very large. It is difficult to describe the variation of the under side, but the two conspicuous blue spots are very remarkable. The specimen was bred, September 21st, 1867, by William Smith, of Birmingham, from a larva taken at Aston; and he stated at the time that the larva had gold spots on each segment. The specimen is now in the possession of Mr. F. Enock.

No. 7. *Liparis dispar.*—Mr. Enock, who possesses the specimen figured, bred in the year 1867 upwards of eight hundred males and females of this species, and nearly all had the under wings notched, as seen in the illustration.

Nos. 8 and 9. *Epione vespertaria.*—No. 8 is a very richly coloured male, very much darker than usual, and wanting the usual reticulated markings. It was captured by Mr. Prest, of York, at Sandburn, near that city, July 13th, 1874. This seems to be an hereditary form, for several have been taken in other seasons, in nearly the same place, of the same shade of colour, but none deeper in tint than this example. No. 9 is a male, with the coloration usually found in the female only. It has also the left anterior wing somewhat reticulated, as in the male, but the right anterior wing and posterior wings are like the other sex. This example was exhibited by its captor, Mr. G. C. Dennis, who took it on the well-known *Vespertaria* ground at Sandburn, on July 22nd of last season.

ENTOMOLOGICAL ECHOES.

Contributed by FREDERICK SMITH, F.Z.S.

DURING the course of the publication of the 'Illustrations of British Entomology,' Mr. J. F. Stephens, the author, received communications from numerous correspondents, in which localities and captures of rare and local species were made known, and much valuable information relative to the habits and economy of others was furnished. The letters were given by Mrs. Stephens, subsequent to the death of her husband, to Dr. Gray, who had them bound up in a volume, which he placed in my hands, with full permission to publish any extracts I might make and deem sufficiently interesting. The collection consists of two hundred and twenty-five distinct letters, all treating more or less on Entomology. The greater part relate to Coleoptera, a considerable number to Lepidoptera, and but one or two to Hymenoptera and Diptera. They give accounts of the occasional capture of foreign species, their visits, the mode whereby they reach this country, &c.—this being in some instances inexplicable; but such captures it will be seen have been formerly made, and will doubtless continue to be made occasionally in future.

A remarkable instance of this kind occurred a few years ago, when a Brazilian wasp was taken in three widely distant localities in England. On an excursion to Cornwall I took up my temporary residence at Penzance, and there met with a lady who collected Coleoptera, and was a resident of the place. I had made her acquaintance previously on one of her visits to London. She took the opportunity of my visit to Penzance of asking me to name a few insects she had captured in her own neighbourhood. On opening her collecting box I at once caught sight of a Brazilian wasp. To my enquiry as to where she had taken that particular insect, she at once replied, "In my own bed-room; several of them flew in, and I caught two or three, as I thought it was an insect I had not previously seen. I took those last year, but I have seen others this year during July and August." On making further enquiries I found the window of the bed-room looked into the harbour of Penzance. I expressed my opinion that the wasps had been imported by ships trading with Brazil. My friend made the necessary enquiries, and ascertained that vessels laden with raw hides had entered the harbour. She was told by one of the captains that as he was sailing down one of the rivers in Brazil these wasps were attracted in such numbers by his savoury cargo as to prove a terrible annoyance to all persons on board, and that considerable numbers of the wasps had continued on board the whole of the voyage home. It was a remarkable circumstance, that subsequently came to my knowledge, that specimens of the same species of wasp, *Polistes biguttatus*, were also taken at Liverpool and in the London Docks the same season.

The above clearly points to the way in which these hymenopterous insects were imported; and we can, on calling to mind the various kinds of freight conveyed from all parts of the world, readily account for the introduction of insects of other orders, some of which, as we well know, have been so long acclimatised as to have taken their place in the lists of our indigenous insects.

Among the letters some have neither date nor address, but are no doubt arranged chronologically; sometimes internal evidence, and sometimes the date of the postmark, supplying the necessary information. The correspondence commences in 1818 and terminates in 1831.

LEPIDOPTERA.

"The swallow-tail, *Machaon*, was found in the caterpillar state feeding on carrots in a garden adjoining some marshes, near Deal, July 7th. It changed into a chrysalis in a few days; and the butterfly appeared in nineteen days.—Miss HARVEY; Upper Deal."

"In your last number I observe you say there is no authentic specimen of *Podalirius* known. I beg leave to state there is one in my possession unset, and taken at Netley; and as there existed doubts about its being a native I have kept it just as I captured it; its larvæ, of which I have had two, feed on the wild white plum tree. One of these days I hope to add it to other collections.—Rev. F. W. HOPE; July 8, 1827."

"An account was sent to you, I believe, by my friend E. Hornor, of the capture of a pair of *P. Podalirius*. The gentleman by whom they were taken, and who resides at Sunderland, says that he caught them several years ago in a wood near Oxford. He showed them to a person who lived near, and he told him that he had seen several of that kind in the same wood. The gentleman who captured them was no entomologist himself, and could not be interested in palming a deception upon the public of entomologists; and imagined some of *Argynnis Paphia*, which he took at the same time, to be much more rare. One of the insects was in a good state of preservation. I myself see no reason to doubt the fact of their having been captured in England. A specimen of *Sphinx lineata* was taken at Sunderland in the year 1823; and *Sphinx Atropos* was taken buzzing about a beehive in search of its favourite food.—J. O. BACKHOUSE; April 16, 1828."

"I have taken *Papilio* (*Steropes*) *Paniscus* several years, between Woodstock and Enstone; *Polyommatus Cimon* (*Acis*), at Coleshill, Warwickshire; *P.* (*Cœnonympha*) *Polydama*, in abundance on the mountains between Bala and Festiniog, North Wales; also with it, as Mr. Haworth assures me, *P. Typhon* (*Cœnonympha Iphis*). Last year I saw in a collection, at Coventry, specimens of the beautiful *Europome* (*Colias Europome*), which I was told had lately been taken at Dudley. *Antiopa* also has been taken of late years near Coventry; one of the specimens I have seen among them has a yellow border, like the foreign ones.—Rev. W. T. BREE; July 14, 1827."

"I send you three specimens of *Hipparchia*, being all I have left of the numerous specimens I took on the mountain bogs, between Bala and Festiniog, North Wales, July 21st, 1809. Of these three I have Haworth's authority for saying that two are *H. Polydama* and one *H. Typhon*, which last is doubtless the reversed specimen. To me, however, it appears to be spinning too fine to separate them.—Rev. W. T. BREE; August 18, 1827."

"I proceed to make a few remarks on what you state under the head of *Hipparchia Iphis*, and *Polydama*, as relates to myself. Your account, though literally true, may yet lead to error, from the circumstance of your not being in possession of the *whole* truth. The fact is I took a number of specimens of one or both species (for they were in great abundance), but was not aware that they were of more than one kind. Many I gave away; and some years after, our friend Haworth, looking over my remaining specimens (some six or seven, perhaps), observed to me that there was one of a different species from the rest. Now I think it probable that I might have taken more than one specimen of *H. Iphis*, and can scarcely doubt that had a more accurate entomologist been on the spot he might have taken both kinds in some plenty.—Rev. W. T. BREE; April 17, 1828."

"*Vanessa Antiopa* has several times been taken near Seaton, in the county of Durham, often floating on the water of the River Tees. I think this fly must breed in the salt marshes, and in windy weather be blown into the water. *Hipparchia Blandina* was taken the beginning of this month plentifully, at Castle Eden Dene. This, I believe, is the only place in England where it is found. It was taken there first, I think, four years ago.—THOS. BACKHOUSE; York, 8 mo. 25, 1827."

"*Pamphila comma* I capture in Collingbourne Wood.—Rev. G. T. RUDD; Kimpton, March 18, 1828."

"In Lepidoptera I have been taking *Pamphila comma;* and Mr. Dale has found it at Old Sarum. In May last I took *Acronycta alni* in Collingbourne Wood, Wilts.—Rev. G. T. RUDD; Kimpton, Andover, September 18, 1828."

"During my collecting this year I have met with empty pupæ cases of *Catocala fraxini;* and although I have searched for it (the moth) have not been able to obtain it. Can you inform me the right period of its assuming the pupa state? I have also taken *Endromis versicolora* this year. After *Colias Edusa* has appeared in profusion I believe the reason why they almost entirely disappear the following season is in consequence of their larvæ being punctured by a peculiar Ichneumon which has a predilection for these insects.—D. G. KERRIDGE; Ipswich, October 22, 1828."

"As I passed through Manchester i saw about 100 *Davus* taken at Ashton Moss this summer, without one a proaching in collor on the under side to *Iphis* or *Polydama;* i think they verey much differ from those teaken in Cumberland. I teaken a nother Clifton Nonperiel (*Catocala fraxini*). Seeman has teaken plenty of Purple Emperors, but I dont like to send to him for some for fear he dont send them fine. I left of loosing my time A showing my insects for nothing, as i found in the calculation of time to be a bout a month in 12 month; so now I makes a charge; if they comes to see must pay me for my time.—RICHARD WEAVER (Collector and Dealer); Birmingham, October 29, 1828."

"In the summer of 1820 I discovered several larvæ of *Psyche fusca* at Hornsey Wood, but being then ignorant of its rarity I took little notice of it; but I reared two specimens. In the years '25 and '26 I was unsuccessful in finding it; but in 1827, on the 22nd June and the 4th July, I took half a pint of larvæ and pupæ on the leaves of the hazel, sallow, and leaves of young oaks; but although I paid every attention to them I only bred three males; nearly all the larvæ were infested with *Ichneumon Psyche*, mihi. On the 17th of July I again found young larvæ, but they, case and all, were not larger than this dot (.); the cases were made of the down from the under sides of the leaves. I supplied them well with food as long as leaves could be obtained; then I left them to their fate, and soon discovered that they had fastened themselves to the top of the inverted tumbler, having previously covered the sides with a fine web. About the end of March they began to stir, when I supplied them with the buds of whitethorn and sallow; they soon began to increase the size of their cases, adding to them fine sawdust and leaves cut very small. After a few weeks they fastened themselves up as before, and remained immovable; this being about eleven months since they were hatched. In a short time a great number of Ichneumons appeared, all quite different from *I. Psyche*. I then examined the cases, and only found in them the shrivelled skin of the caterpillar. In the month of June of the present year (1828) I met with abundant larvæ and pupæ, and collected a large box full. In the beginning of July the perfect insects began to make their appearance, but I only obtained four males and two females. I have also found them in Highgate Wood. It is past a doubt with me that the larvæ are two seasons coming to perfection. This may account for so many being stung by the Ichneumon.—A. INGPEN; November 24, 1828."

"Enclosed is a wing of *Lophopteryx carmelita*. I have no doubt of it, as it agrees with the figure and description in thy work. I found it in Ongar Park, on the 22nd of April, 1828. *Thyatira batis* is by no means an uncommon insect here.—HENRY DOUBLEDAY; 5th Month 15th, 1829."

"*Endromis versicolor* has been taken this year in Suffolk, by Mr. Kerridge, a chemist, of Ipswich.—Rev. WM. KIRBY."

"I may mention that *Papilio* (*Arge*) *galathea* was plentiful about St. Margaret's Bay, near Dover: this was in 1798 and 1799. In 1804 the captain of a vessel brought me a death's-head moth, which he saw fly and settle in the sails when he was several miles from shore, near the mouth of the Bristol Channel. They are plentiful about once in seven years about Swansea.—L. W. DILLWYN; October 12, 1829."

COLEOPTERA.

"I have lately added to my collection two splendid specimens of *Calosoma sycophanta*, and with them have heard some interesting accounts. One of them I obtained of a fisherman, who says that he took it in his net at sea, alive, between thirty and forty miles off this coast; and upon enquiry I have heard of several others taken in the same way. The fishermen tell me that they live at sea feeding upon fish; and one man assures me that he has kept one many days which fed upon mackerel.—W. C. HEWITSON."

"We meet with *Carabus nitens* on Stockton Common, four miles from York; and *Nebria livida*, under stones, on the sea-shore to the north of Scarborough Castle, the beginning of June.—THOS. BACKHOUSE; 25th 8 mo., 1827."

"Having read in Mr. Samouelle's book that *Notoxus monoceras* is a rare insect, I write to say that I have lately taken several in a lane between this place and Richmond, called Sandy Lane; and a young friend in company with me discovered about twenty feasting voluptuously upon the body of *Meloë proscarabæus.* In addition to the former notice I may add that I caught *N. monoceros* repeatedly in the fly-net by accident, they were in such abundance.—THOS. P. HAVERFIELD; April 30, 1828."

"I may add as to *Rhinobatus ebeneus* (*Larinus carlinæ*) it occurred in great plenty last year at the edge of Collingbourne Wood (near Kimpton) the beginning of August, but I did not know its value, and so failed to secure more specimens than the two I sent.—Rev. G. T. RUDD; July, 1828."

"Respecting the *Stylops* I may inform thee that I bred four specimens from a species of *Andrena*, very common here on the whitethorn in May, but do not know its specific name.—HENRY DOUBLEDAY; Epping, 9 mo. 2, 1828."

"Mr. Dale tells me that he has taken larvæ of three new species of *Stylops*, besides the species Curtis has given. He complains sadly of the past season, and seems to have done little except in *Stylops.* In Coleoptera I have taken *Licinus depressus*, twelve males and three females during last month and up to this date; I have also taken *Buprestis viridis*, three specimens; also *Elater cupreus; Elater bipunctulatus* was very common in the winter; also *Criocerus nigra*, Marsh. (*Eryx atra*). Mr. Dale has at length hit upon the method of breeding *Stylops*, and says that he considers it one of our commonest British insects!—Rev. G. T. RUDD; Oct. 21, 1828."

"As to *Stylops* I am concerned to say that I had, by an accident, four specimens destroyed, all of which I had hoped to have sent to you. It is, however, so common an insect, that, if we live, I can I dare say send you a dozen specimens next season.—Rev. G. T. RUDD; May 18, 1829."

"*Licinus cassideus* was taken at Aldborough, Suffolk, in 1824. It is in the British Museum. *Epomis circumscriptus*, in meadows at Netley. *Necrophorus germanicus*, Lord Abingdon's Wood, near Oxford.—Rev. F. W. HOPE; 1828."

"*Hamaticherus heros*, on trunk of an elm, near Colney Hatch.—A. INGPEN; November, 1831."

"I have been taking *Polydrosus sericius* freely, and also *Elater* (*Cardiophorus*) *thoracicus*, in Littleton Copse.—Rev. G. T. RUDD; Kimpton, June 1, 1829."

"I take the following insects in the neighbourhood of Bristol:—*Cerambyx* (*Lamia*) *textor*, *Scarabæus* (*Copris*) *lunaris*, *Scarabæus* (*Bolbocerus*) *mobilicornis* (in Lord Clifford's Park), *Curculio* (*Platyrhinus*) *latirostris;* and at Lundy Island, *Scarabæus typhæus* (*Typhæus vulgaris*).—GEORGE WARING; Bristol, June 21, 1829."

NOTE.—This insect is not in the list of Coleoptera of Lundy, given in Mr. J. R. Chanter's 'Monograph,' lately published.

"I find *Nebria livida* in plenty near Redcar, Guisboro', Yorkshire; also *Dischirius nitidus* in profusion, and a species the size of '*nitidus*,' but it is castaneous and opaque; *Bledius tricornis* is in profusion; *Notoxus monoceras* is also here in profusion. What have you made of the insect I sent you like *Oiceoptoma thoracica*, but with the sides of the thorax angulated? I found it at Amesbury.—Rev. G. T. RUDD; Redcar, Guisboro', Yorkshire."

"In consequence of the summer having been so very wet I have done very little in collecting, but have added a few insects to my cabinet, amongst which are *Apate capucinus* and *Lamia* (*Monochamus*) *sartor*. I saw at Yarmouth, in the possession of Mr. Paget, a specimen of *Tenebrio* (*Blaps*) *gigas*, taken by his friend Mr. Williams, of Ipswich, under the bark of a tree. Curtis says that Mr. Griesbach also has one.—JOSH. SPARSHALL; Norwich, October 24, 1829."

"*Saperda ferrea* (*Stenostola nigripes*), taken abundantly here in June, 1828; but last summer sparingly; it was taken previously at Manchester.—GODFREY HOWIT; Nottingham, December, 1829."

"I shall now mention a few of my recent captures:—*Odacantha melanura*, in plenty in the sedge boats; *Dromius sigma*, in moss, Midingley Wood, near Cambridge; *Colymbetes Grapii*, near Cambridge; *Platyrhinus latirostris*, Bath, in *Sphœrea fraxini; Prionus coriarius*, Misley, near Cambridge; *Saperda carcarias*, Cambridge.—CHAS. C. BABINGTON; St. John's Coll., Cam."

"I have taken the liberty of sending you the localities of some insects:—*Pogonocherus nebulosus*, Rose Castle; *Pogonocherus hispidus*, Botchardby Mill; *Saperda oculata*, Baron Wood; *Pachyta octomaculata*, Baron Wood.—T. C. HEYSHAM; Carlisle, July 5, 1831."

"I have just finished A case of Insects that i ham going to Present it to Hir Royall Hiness Princess Victoria to solicite the feavour of hir neame as one of the peaterons of my Museum. The Insects are in a gilt freame, and the freame fitts in a Case meade in the sheape of a larege Book, full bound in red and ornemended with gold, with the jeneric and specific Neames a fixt to each, and a Peaper with the jeneric and spc. Neames ritten, and the diffrent Countys I have collected them in, and Neamed by Mr. Stephens.—RICHD. WEAVER; Birmingham, August 28, 1830; Museum, 38, New Street."

ENTOMOLOGICAL RAMBLES, 1877.

By J. B. HODGKINSON.

(Continued from p. 113.)

DURING the first week in August I captured several worn specimens of *Coccyx nanana* by beating the spruce in the Hon. F. Stanley's plantations, at Witherslack, on the bank opposite the "Derby Arms," in the afternoon sunshine. *Asychna profugella* was flying rapidly about, but scarcer than usual. There were still a good number of plumes out,—*Pterophorus plagiodactylus, P. parvidactylus, P. tetradactylus*, and *P. bipunctidactylus;* this latter is a much later species than the others: indeed last season there seemed to be no fixed time for insects appearing; they came out in driblets. The females of *Zelleria hepariella* (*insignipennella*) were now out, and would be until March following. The males of this species are soon over, though the females may be beaten out of the yews all winter, and varying from pale yellow to rich red; one most extraordinary thing is I have never as yet found a male with any variation worth note. Had I not frequently taken what should be *Z. insignipennella* in copulâ with *Z. hepariella* I might not have been so sure that they are both one species. Very few moths were stirring; though plenty of *Crambus falsellus*, *C. geniculellus*, *C. inquinatellus*, and *C. pinetellus* are to be dislodged out of the old hollies and yews. Geometra few; Noctuæ only odd specimens. *Mamestra furva* and *Cerigo cytherea*, &c., beaten out from under the banks. I did not try sugaring, having to be careful about rheumatism; but during the afternoon sunshine *Dicrorampha acuminatana*, *Gelechia atrella*, *G. gemmella*, and *G. anthyllidella* were flying actively about; and odd *G. junctella* got up; this species still keeps very rare, and is one of this genus which hybernates.

During the whole of August and September little or nothing of importance turned up amongst imagos. Most of the time was employed in larva hunting, chiefly for *Nepticula;* and among the larger species I met with several *Cucullia asteris* larvæ on the golden-rod, and also on the China-aster. The first I found were in a garden. I had a strange adventure with a *Cucullia gnaphalii* larva: I let one feed on a plant of the golden-rod in my room, subject to no other confinement; it never offered to leave the plant for a fortnight; but when I had been absent for three days, on my return my "shark" was gone. I looked everywhere in the room, still hoping it would crawl out of some corner, until at last it was given up. Several days after, my servant was making her bed in another room some distance away, when she brought my lost one back, having found it under her pillow, apparently preparing to change. After that it was put under restraint; and I expect to see it creep up shortly out of my flower-pot in another form. I met with an *Acronycta alni* larva at Grange, as did Mr. Threlfall; mine was sickly, and looked as if it was ichneumoned. Of *Botys terrealis* larvæ I got a good supply, but it is a most difficult species to rear. I find it best to let them ramble about in my room, and go to pupa where they please, for the moths always go to the window. It was very lucky that I took all I could find on all the plants in one locality, for the railway company are making invasions on a special corner, where both *B. terrealis* and *Eupithecia denotata* larvæ are; and where the latter might be found in scores on the seeds of *Pimpinella saxifraga:* some of the larvæ were green where the seeds were green; and, later in the season, when the seeds were brown the larvæ were chiefly brown; evidently a provision for self-protection. On visiting this special corner recently I found it was covered and filled up with some twenty feet of soil, and railway rails laid over the spot. There are also large mansions being built on my *Aspidiscana* ground. One by one my happy hunting grounds disappear; and we have to go forth again to find "fresh woods and pastures new."

I had long wanted to see the larva and case of *Coleophora melilotella*; so during the first week in September Mr. Threlfall and I set off for Darlington. After a five hours' railway ride we found ourselves at Barnard Castle; and having missed Mr. Sang we strolled into the town, and found a bird-stuffer who had only about a score of moths; and how odd that one should be a fine *Sphinx convolvuli*, and another the handsome little *Anesychia funerella*. That evening we put up with Mr. Sang; and next day he took us on to the railway bank and showed us how to find the cases of *C. melilotella*, which are by no means easy to find: it is just like the dark seeds of the *Melilotus*; and now and again three cases would be sticking end to end. There we saw several larvæ, which Mr. Sang picked up for us to show how they fed, such as *Nepticula cryptella*, *Gelechia intaminatella*, &c. On the day following we all three went to Highforce, Middleton-in-Teesdale, some twenty-five miles from Darlington, and found a number of larvæ of *Coleophora Wilkinsonella* and *C. paripennella* on the birch. The rains had beaten everything down. We went specially to look for the rare *Acrolepia betuletella*, but it was no use; though every little moth we beat out was soon caught. The best were *Mixodia Ratzburghiana*, some in fine condition. These ought to have been out in July.

We parted with Mr. Sang at Barnard Castle, having spent three days greatly to our advantage in knowledge. Nothing surprised me more than to see that such an unentomological looking district had yielded so many novelties as Mr. Sang had turned up, such as *Gelechia solutella* (a Rannoch species) and *Elachista paludum* (a Norfolk fen species); but it is the old adage which stands as good as ever,—"He who works will win."

DESCRIPTIONS OF OAK-GALLS.

Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen.'

By Edward A. Fitch.

(Continued from p. 147.)

89. *Cynips caput-medusæ*, Hart.—This remarkably fine gall first appears with the opening of the fruit buds in May. In the neighbourhood of Vienna it occurs in such numbers

on the young twigs of ***Quercus sessiliflora*** and ***Q. pubescens*** that they are often bent down by them. A thick disk is developed on one side of the cup, the edge of which is at first surrounded with small conical projections, but the upper surface very soon becomes covered with numerous, more or

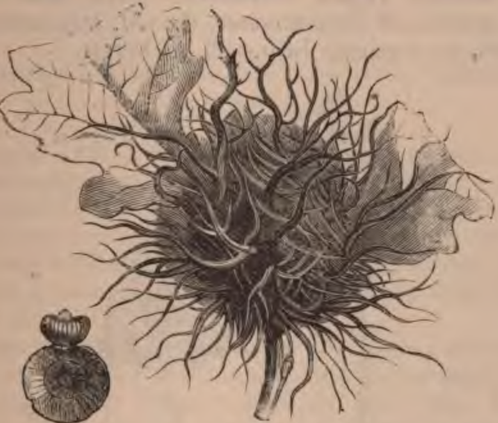

Fig. 89.—Gall of *Cynips caput-medusæ*, and cup with the inner gall.

less bent, red thread-like growths, which are pointed at the ends, and bear a great resemblance to the tentacles of a sea-anemone (*Actinia*). In some cases the disk does not widen, but the edges are turned inwards towards the base, whilst the protuberances grow on, and numerous thread-like side branches are produced, which spread themselves in all directions, so that the disk becomes quite hidden, and when the gall matures scarcely more than these are noticeable. In the centre of the disk there is transversely a thin-walled, single-chambered inner gall, which is separated from the surrounding gall substance when ripe. Several galls often grow so near together that they appear like a single gall, as large as a man's fist. The galls become mature at the beginning of winter, and during the cold season a great many fall off the trees, but many remain. From both the flies appear in February: these are best to be obtained by collecting the inner galls at the end of January.—G. L. MAYR.

We now come to the sixth and last division, namely, the fruit-galls,—those species which produce galls either on or in the fertile flower, or acorn. It is doubtful whether any of the four or five European species occur in Britain. The fine Bedeguar-like gall, now under notice, would certainly be recognised, and it is unrecorded; but if it has been found the beautiful figure may recall it to mind. No less than four species of *Synergus* are known to make a home of this gall, amongst others; *Olynx trilineata*, Mayr, and the two common species of *Megastigmus*, viz. *M. stigmaticans* and *M. dorsalis*, are parasitic in it.—E. A. Fitch.

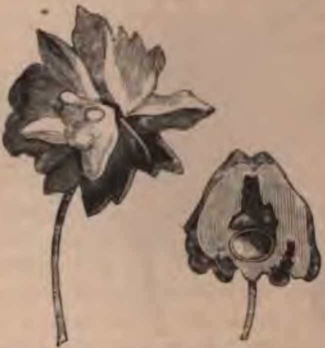

Fig. 90.—Gall of *Cynips calicis*, and in section.

90. *Cynips calicis*, Burgsdorff.—The well-known "Knopper"—which occurs on *Quercus pedunculata* and, according to Schlechtendal, also on *Q. sessiliflora*—is the nearest relation to the above-described species. The gall appears at the beginning of summer, between the acorn and the cup, at the bottom of the latter, forming at first an inverted cone or a thick disk, which becomes hemispherical by degrees; it is strongly ribbed radiately and compressed at the side, a rounded papilla appearing at the apex. The margin of the disk, however, soon becomes more and more curved downwards, and the involucre more or less surrounded. There is a hole at the central point from which the radial striæ emanate, and which corresponds to the apex of the gall: this is the mouth of a cavity, which is divided from a second cavity at the base of the gall by a transverse partition. This inferior cavity contains the single-chambered inner gall, apparently loose. The gall-fly leaves the inner gall in February or March, and eating through the above-mentioned partition makes its exit by the hole opposite the base of the gall.—G. L. Mayr.

The Knoppern galls do not occur with us; five species of *Synergus* and *Megastigmus stigmaticans* are connected with them. Like the gall-maker all are to be bred in the spring and early summer of the second year. The economy of *Synergus vulgaris* in this gall is interesting.—E. A. FITCH.

THE GREEN FIELD-CRICKET (ACRIDA VIRIDISSIMA).

By W. G. TENANT.

ON August 14th, 1876, a friend gave me a male specimen of this interesting and handsome insect. I made a house for him—consisting of a box, the top of which, instead of having a lid, was nearly covered by a pane of glass—for the purpose of observing his habits; over where the glass did not cover I fastened a piece of perforated zinc, thus admitting both light and air.

Amongst his habits, which under these circumstances did not seem to be multifarious, the commonest one was the licking of his tarsi, which, by the way, I suspect was often done for the purpose of making a sure footing in walking; and especially would he do this while walking, body inverted, on the under side of the glass cover of his house, for I observed that when he apparently failed to adhere to the glass, and he was in danger of falling to the bottom, then he would lick the tarsi; after which he was enabled to pursue his course in safety. So often as the tarsi appeared to fail to adhere, so often did he place them in his mouth; and from this fact I have very little doubt but that the secretion with which he moistened them enabled him to walk, body inverted, with safety. I can hardly suppose it was so often done for the purposes of cleanliness only.

He was ravenous at times, killing and eating a moth (*Tryphæna pronuba*), though, so far as I observed, he never seemed to notice their presence, and only attacked them when they approached him. With his mandibles he scooped out the contents of the abdomen, seldom mutilating to any extent the integument. A mischievous urchin placed a humble-bee in his cage, which I allowed to remain, though not with any easy mind, being afraid it might sting and hurt the cricket. Very soon afterwards, however, I was surprised to find the bee lying helpless at the bottom of the cage: how it had become so I did not know; but I had seen the cricket strike the bee when it fluttered near him; yet I hardly imagine those blows were sufficient to render it *hors de combat*. Some little time after the cricket inserted his mandibles in the abdomen of the bee, and, having succeeded in abstracting the honey-bag, forthwith proceeded to eat it, leaving the bee still alive. I allowed the bee to live two or three hours, thinking the cricket would return to it to eat the contents of the abdomen; but he did not; and finding he had no apparent intention of so doing, I killed the bee. Butterflies he was immensely fond of, allowing them to live very little time after being placed in his cage. In no instance, however, did he eat the wings and head of either moth or butterfly. He lived until September 25th.

Two days after the cricket died a lad took it out of its cage, where I had allowed it to remain, and began handling it. Boy-like, and for no other purpose but pleasing himself, he expanded its elytra, and then by the application of his fore finger and thumb compressed them sharply. I was surprised to hear a distinct chirp,—a more distinct one than which the cricket himself could not have produced had he been alive. I repeated the act, succeeding at will in producing the chirp. This led me to examine the elytra to ascertain, if possible, how the chirp was produced, and with the following result:—

On the upper surface of the under wing-case will be found what may well be compared to the head of a drum: its appearance is vitreous, and it is surrounded by a membranous ridge; on the under surface of the upper wing-cover a depression exists, showing where this so-called drum-head meets the upper wing-cover when the elytra are closed; anterior to this depression is a ridge so set that, while the elytra are being closed, it chafes against the anterior left and free end of the under wing-cover. This chafing or friction produces the chirp. The edging of the under wing-cover where this friction takes place appears to be composed of the same membranous substance as the ridge of the upper wing-cover, just mentioned.

My opinion is that the chirp is produced by a rapid closing of the elytra, and not by their expansion; and if this be true it will account for the chirping not being one prolonged sound (as in the case of whistling), even when the cricket is chirping its loudest and fastest. That the cricket moves its elytra when so doing is without doubt correct;

and Mr. Robert Laddiman, of this city, assures me that he has repeatedly observed this action. As the ridge upon the under surface of the upper wing-cover, when the elytra are closed, rests in a position anterior to the before-mentioned drum-head of the under wing-cover, it would appear that the membranous ridge surrounding the glassy surface of the drum has not by any friction of its parts anything to do with the production of the chirp; and I think it probable the drum-head is an apparatus for the reflection of the chirp-sound in any direction, and at the will of the cricket, for it is well known that the insect is not always to be found in the spot from whence its chirp appears to proceed. As the male bird sings for the delectation of the female and to attract her attention, so undoubtedly does the male cricket chirp; for the female cricket possesses no such apparatus as I have described, and as far as I can ascertain does not chirp.

As the time is at hand when this beautiful insect is in full vigour of life and song, and may be easily obtained, it would be well if some of the readers of the 'Entomologist' would secure specimens, and see if they can or cannot substantiate my foregoing remarks on the singing of *Acrida viridissima.*

Upper Rupert Street, Norwich.

NOTICE OF BOOK.

The Natural History of Hastings and St. Leonards. Published by Hastings and St. Leonards Philosophical and Natural History Society, 1878.

This little work consists of a mere list of names of all kinds of animals and insects which have been observed in the neighbourhood of Hastings, both on land and in the sea. Excepting that it gives the relative abundance, or scarcity, of each species, it is little more than a mere list of names, without localities or any information which would be of use to the comparative naturalist. Nevertheless it forms a good basis upon which to found more useful work. The order Insecta occupies about twenty-four pages out of sixty; and all orders seem to have been fairly worked out.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Life-history of Deiopeia pulchella.—The history of this beautiful species, as given in our English works on Lepidoptera, being only a short and imperfect account, copied from continental authors, and as I have just been favoured with the rare opportunity of rearing this species from the eggs (for the first time, I believe, in England), the following notes may be interesting. The eggs were most kindly sent me by Mr. Joseph Sidebotham, who had been staying for some months at Mentone, Alpes-Maritimes, in which locality he had the pleasure of seeing *Deiopeia pulchella* on the wing, in October, 1877, when he got eggs, which duly hatched, but the young larvæ refused all kinds of food offered to them. During May, this 1878, the imagines again appeared, and Mr. Sidebotham secured some eggs, which he sent to me by post to try my fortune with them. They reached me May 24th, and some of them had hatched *en route*. The remaining eggs produced larvæ the day of arrival. Mr. Sidebotham writes to me:—"I find *Pulchella* round here (Mentone), from the sea level to an elevation of one thousand feet, at which height it is found on the rosemary, a large white-flowered *Cistus*, or rock-rose, and on pine trees; at the sea level, where it is more abundant, it frequents myrtle, *Trifolium stellatum*, *Cytisus scoparius*," &c. Here too, in England, it shows a partiality for the coast, a few occurring most seasons along the south-west coast, from Kent to Devonshire. When first hatched they are of a dull orange-colour, slightly hairy, sluggish, and of rather a maggot-like appearance; the head is small and black. The first casting of skin was on June 3rd, when they became darker coloured, and of a greenish black tint, the segments being well defined, a transverse dull orange band and six black spots on each, and a few black bristly hairs. The second moult, *i.e.* on third skin, the transverse orange bands become less defined, and an interrupted chain of white dorsal spots appear; these spots are of varied characters, largest in the centre of each segment, decreasing both anteriorly and posteriorly, and a spiracular line also appears of a whitish gray colour, the spiracles being of a dull orange. About June 17th the third and final moult took place; and in this stage they varied very much in different individuals. By taking the most marked forms, or varieties, you might roughly describe the darkest type as a black larva, with an interrupted chain of white dorsal spots, and with a more indistinctly defined whitish spiracular line; whilst the paler type might not inaptly be called a creamy white larva, with transverse bands of markings: these transverse bands are composed of a fine dull orange band (quite lost in the dark form), bordered on either side by largish black dots, just touching on their outer margins, four of these spots being larger than the rest; two on either side of the orange bands are on the dorsal area, and by the strong contrast of jet-black on the creamy white ground form the broadish, irregular, chain-like pattern of the dorsal area; smaller black spots, with a little gray shading, produce a faint spiracular line; the spiracles being dull orange, which on the anterior segments show rather more of the orange colour. The larva is thinly covered with stiffish hairs; those of the dorsal area being black, and those of the spiracular area white. The ventral surface is dull lead-colour in all of them. When full grown they measure one-eighth of an inch, are moderately stout, slightly thickest in the middle, decreasing a little to each extremity; the head is rather small, and of a mottled brown colour; the segments are well defined. As to treatment—when first hatched I placed them in a wide-mouthed bottle, and tried them with a variety of likely plants; and I had the satisfaction of seeing that they ate a garden variety of *Myosotis*, and also *Borago officinalis;* by preference the former plant, but being an early flowering species it was getting out of flower and much covered with *Aphis*. I tried them with the common forget-me-not (*Myosotis palustris*), of our brooks, and they took to feeding on it at once, eating both flowers and leaves, and throve well. They were full fed from June 24th to 30th, when some of them commenced spinning a fine white silky cocoon on the surface of the ground, introducing a few grains of earth, &c., into its composition, so as to give it the character of surrounding objects, doubtless for protection. Others spun in like manner. Three of them spun a fine white web amongst the food-plant, through which could be seen the moderately stout, reddish brown pupa, showing a slight indication of the spots on the abdominal surface of the imago. The first imago appeared, July 16th, a fine female; another on the 17th; and a very large male on the 18th. The coloration of the first is extremely bright, the crimson spots being both large and deeply coloured. In the two last the crimson is less bright, nd in fact quite of our English type, allowing for the fine ondition of being freshly bred. Should any fortunate collector meet with a female *Deiopeia pulchella* on our English coast this year, I hope he will give her a chance to supply him with some genuine "native" eggs before consigning her to the cyanide bottle; and then possibly my experience may help him to success with them.—WILLIAM HENRY TUGWELL; 3, Lewisham Road, Greenwich, July 18, 1878.

ACHERONTIA ATROPOS.—In August and September of last year I had a dozen larvæ of *Acherontia Atropos*, all of which were found feeding on potato-leaves. The ground colour of the whole of them was green. In due course they turned into pupæ, and with the exception of two went down into earth, finely sifted and placed in flower-pots for their especial behoof. The two alluded to refused to bury themselves, and underwent their metamorphosis on the top of the earth, one of them emerging an imago in November. This was a very noisy insect, squeaking loudly in the three stages of larva, pupa, and imago. The other, though the moth was perfectly formed, died in the pupa-case. November passed, and December, and I then gave up all hope of seeing any more autumnal specimens. I knew from experience what a troublesome creature the moth is to rear; and many of my entomological friends gave me little encouragement as to their appearing in the spring. However, I did not despair; but kept the breeding-cage, in which I had put the flower-pots, before the kitchen fire. April came and no moths; therefore I determined to turn them all out and satisfy myself whether they were alive or dead. Fortunate resolution this: I found the earth, which I had taken such pains to pulverise, cemented into a hardness rivalling a macadamised road. Alas! one poor moth had burst from the pupa, only to perish miserably in its "living tomb," the mould being so hard that it could not possibly push its way to the top. It would have been a splendid insect, judging from the size of its body. I then carefully examined the others, two of which I discovered were dead. The remainder I took up and laid in moss, and still kept before the fire. About the middle of June, when the weather became intensely hot, I carried the cage into the greenhouse, thinking that the sun's heat would be better than artificial. A few days after, namely, on the 18th of that month, great was my delight to find a fine male had emerged. Of course I then paid not only daily, but frequent, visits to the cage; and on the 23rd found another male. The next day a large female emerged; on the following day, another male; on the 28th, another male; on the 29th, another, a male likewise. My last specimen was delayed by the sudden change in the weather till the 5th of July, when it came out; making the sixth male, and eighth fine specimen. Each of these insects squeaked loudly,—louder than a mouse when a victim to the tender mercies of a cat.—JOSEPH ANDERSON; jun.; Chichester.

ANTICLEA SINUATA AT BOX HILL.—On July 21st, whilst collecting at Box Hill, I was agreeably surprised at beating a fair specimen of *Anticlea sinuata* out of a box tree.—A. W. PRIEST; 16A, Merton Road, Stamford Road, Kensington, July 22, 1878.

RARE TORTRICES THIS SEASON.—While collecting near Leatherhead on April 27th last, in company with Dr. Gill, I captured a specimen of *Spilonota pauperana* flying in the sunshine over wild rose bushes; it was slightly worn, and its late appearance was probably the reason why I failed to find any more: so far as I am aware this is the first record of the capture of this local species in Surrey. On May 25th, at Tilgate Forest, I took one *Ephippiphora ravulana*: the day was very showery, and this was almost the only insect to be seen during a passing gleam of sunshine. I have succeeded in rearing a few *E. gallicolana*, and have also taken two specimens of this species, which I consider to be identical with *E. obscurana*, though I must postpone my reasons for this decision to a future number.—WALTER P. WESTON; 1, Duncan Terrace, N.

GELECHIA GERRONELLA BRED.—I have bred two specimens of this from larvæ collected in furze bushes, near Snaresbrook Station, in the early part of June. They came out amongst a number of *Grandipennis* at the end of June and beginning of July. I subsequently went over to the place, and beat from the furze ten good specimens of *Gelechia gerronella*. *Anarsia spartiella* and *Cemiostoma spartifoliella* were both common.—W. MACHIN; 22, Argyle Road, Carlton Square, E., July 18, 1875.

RHODOPHÆA CONSOCIELLA AT ARNSIDE.—A month ago, when looking for larvæ of *Penthina incarnatana*, I noticed the young oaks all crumpled up in a form I had not seen before: I thought they could not be the common Pea-green, *Tortrix viridana*, but that possibly they might be knot-horn larvæ; however, I sent two to Mr. Barrett for an opinion. As he sent none I concluded they were some common thing after all. I had filled my inside pockets with leaves; and judge of my surprise when *R. consociella*, but many of them crippled, began to appear in my room. I wetted all the leaves again, and bred about thirty-five specimens. This is the first occurrence in the North of this insect.—J. B. Hodgkinson; 15, Spring Bank, Preston, July 17, 1878.

Incurvaria canariella Bred.—I have bred several specimens of this rarity from *Rosa spinosissima*, which I found at Arnside. This is the only English locality; but it has also occurred in the Isle of Man, where my old friend Hague, of Staleybridge, first took it twenty years ago. This new district of Arnside has, as I expected, shown up well, being a high hill above the sea; but as the wind is always blowing, more or less, it gives one a poor chance of collecting.—Id.

Description of the Larva of Botys asinalis.—On May 11th, 1876, I received through the kindness of Mr. A. E. Hudd, of Clifton, Bristol, half a dozen larvæ of this species. Two of them were full grown, and were an inch and an eighth in length; the middle segments plump and round, but each becomes smaller than its predecessor from the middle to the extremities, giving the body a strongly attenuated appearance. Head broad when seen from above, but narrow when viewed from the side; the lobes rather rounded and polished. Body irregularly cylindrical, each segment tapering towards its edges, and thus rendering the divisions very conspicuous; each segment is also further divided into two parts by a central transverse groove. Skin soft and semitranslucent, clothed with a few short hairs. The last pair of prolegs are extended in a >-like form beyond the anal segment. Ground colour dull pinkish brown (brighter in young specimens): head straw-colour, marked with darker brown; dorsal stripe pale pinkish yellow, intersected throughout with a dark olive-brown line; subdorsal stripes also pinkish yellow, broadly bordered above with olive-brown; indeed, this dark colour forms a broad stripe between the dorsal and subdorsal lines; spiracles and trapezoidal dots distinct, black; ventral surface, legs, and prolegs, grayish green. The skin is so transparent that the movements of all the muscles can be distinctly seen. Feeds on *Rubia peregrina;* and in some seasons the larvæ are so abundant in the neighbourhood of Bristol that the conspicuous marks made by them on the madder plants form quite a feature in the locality.—GEO. T. PORRITT; Highroyd House, Huddersfield, July 4, 1878.

NOTE ON PROTECTED COLEOPTERA.—To the list of specially protected insects we may, I think, venture to add *Pyrochroa coccinea*. Several specimens which I have thrown to poultry have been decidedly rejected: its boldness is as well-marked as its coloration is striking. It is, by the way, a destroyer of *Aphides;* and so are *Malachius æneus* and *M. bipustulatus*. A few days ago I was hastily called to look at a "wasp without wings," which had been imprisoned under a tumbler. It proved to be a large specimen of *Clytus arietis*. The boldness of this insect, and its indifference when a hand is put forth to seize it, as I have frequently remarked this season, show that its wasp-like coloration proves, under ordinary circumstances, a sufficient protection. In this respect it differs strikingly from *Callidium violaceum*, a common species here, which on the least approach of danger disappears round the post, rail, or branch, upon which it is sitting, with admirable neatness and speed. My experiments show that it is not protected by any repulsive odour or taste, as it is readily devoured by birds.—J. W. SLATER; 3, Bicester Road, Aylesbury, July 6, 1878.

ON PARTHENOGENESIS IN THE TENTHREDINIDÆ.—The result of the experiment recorded by Mr. P. Cameron (Ent. Mo. Mag. for June last) induced me to try the same experiment with another sawfly, *Eriocampa ovata*, which enables me to corroborate the result obtained by that gentleman. When I saw the article above alluded to I determined the first opportunity to try the same myself; as I had several bottles containing sawfly pupæ I had not long to wait. I keep these bottles in my bed-room: on getting out of bed on June 23rd I looked at the bottles; there were no sawflies in any of them; but before I had finished dressing a female was crawling up the side of one of the bottles, which I immediately boxed; and a few minutes afterwards another, which I likewise boxed. Having secured them in separate boxes I went out and procured a spray of alder; this I got from a cold sheltered spot, with a north aspect, as being least likely to have the leaves already punctured by sawflies. I put the sprig of alder into a bottle of water, and that under a bell-glass; I then tried to put the two female sawflies under it, but as it was in the sun, and on a very hot day, they were very active, and one of them escaped, for which now I am not sorry; the other no sooner flew on to the leaves than she began to lay, or at least puncture the leaves: this she did in the following manner:—she walked slowly about the leaf, restlessly feeling the surface with the end of the sheaths of the saw; this she did by continually drawing the saws to her by bending her abdomen; when she was satisfied with the spot, the saws were lowered nearly at right angles to the abdomen; a starting point was evidently then made; after which the body was turned on one side, and the saws gradually forced sideways into the leaf, until the abdomen reached quite close to the surface; she then remained quiet a very short time, and gradually withdrew the saws again: it seemed to me that the blades of the saw were opened before and whilst being withdrawn, exactly in the same manner as a glove-stretcher is used; the motion of the saw whilst puncturing the leaf was a succession of short pushes, and a very slight withdrawal before each push; the operation took somewhere about half a minute; the eggs were laid, or at least the punctures were made, in quick succession. The fly died about the middle of the week, most probably from starvation. When the leaf was punctured the entrance of the hole could clearly be seen with the aid of a glass; it had the appearance of a small bruise. On Friday when I went to give the alder more water I noticed that some of the leaves were covered rather thickly with brown spots. On the evening of June 30th, on going again to water the sprig, I was struck with the appearance of the leaves; and on using the lens I found that the eggs had hatched, and young larvæ were crawling about the leaves. The brown patches were now in holes, having been eaten through. Of course it is just possible that the leaves may have had the eggs deposited in them before I cut the sprig, but from the situation from which it came I do not think it likely; or at least if an *Eriocampa ovata* should have laid its eggs in the leaves, I do not think she would have laid so many in a leaf as there are in the leaves of my sprig. To be quite sure, in such a case, the alder should have been protected from any chance of visitation from a strange sawfly before the experimental one was introduced; still I feel perfectly satisfied myself with the results of the experiment. I may say I have not yet met with the male of *Eriocampa ovata;* and I am quite positive this female never saw one. Since the above was written the leaves got rather dry in the night, and most of the young larvæ left the leaves, and as these were not covered they escaped.—JOHN B. BRIDGMAN; Norwich, July 3, 1878.

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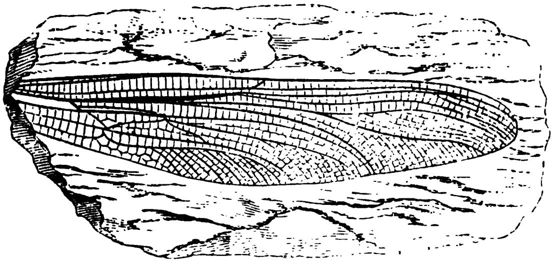
NOTES ON A FOSSIL WING OF A DRAGONFLY, FROM THE BOURNEMOUTH LEAF BEDS.

By H. Goss, F.L.S., F.G.S.



Right fore wing of a Species of *Libellulidæ*.

THAT insects made their appearance at a comparatively early period of the world's history is proved by the vast antiquity of the oldest geological formations in which their remains have been discovered; and the researches of the geologist and palæontologist have furnished conclusive evidence that ages before the existing families of the Vertebrata had come into being most of the family types of the Insecta were abundantly represented, and had obtained a wide geographical distribution.

It may, at first sight, seem almost incredible that the remains of any animals of so delicate and fragile a nature as insects could be preserved for centuries in a sufficiently perfect state as to be recognisable at the present day. Not only, however, have the wings and wing-cases of thousands of insects been discovered in such a state of preservation as to admit of their identification with those of existing orders, families, and genera, but in many instances—from the nature of the matrix in which they have been embedded, or the circumstances under which their deposition and petrification took place—they have been so perfectly preserved as to enable an entomologist to pronounce with some degree of certainty as to the species to which they belonged.

The Coleoptera are, of course, from their nature, much more capable of resisting the effects of air and water than insects of other classes; but even the delicate wings of Neuroptera, Hymenoptera, and Diptera, are sometimes preserved in great perfection. From the fragmentary and imperfect state, however, of many fossil insects, it is evident that they have not all been embedded under similar conditions, or under circumstances equally favourable to their preservation; and numbers have, prior to their deposition and subsequent petrification, apparently been blown about by winds, or remained for years soddening in water. That insects are capable of resisting for a lengthened period the effects of air and water has been proved by actual experiment; and Dr. Hagen states that he has kept the wings of dragonflies in water for years without observing the slightest change in their texture.

In the course of last year and the year before last, Mr. John Starkie Gardner, F.G.S., who is studying the fossil flora of the Bournemouth leaf beds, belonging to the Bagshot Sands (Middle Eocene), discovered numerous fossil insects in these beds, associated with the plant remains which were the especial objects of his search. These insects, which Mr. Gardner has been good enough to lend me for examination, are principally Coleoptera (*Curculionidæ*, *Buprestidæ*, &c.) and Neuroptera. Amongst the remains of the last-named order, the best preserved and most interesting specimen is the right fore wing (figured above) of a species of *Libellulidæ*. On first examining this fossil I was doubtful whether to refer it to the genus *Libellula* or the genus *Æschna*; but Mr. C. O. Waterhouse, after carefully examining it and comparing it with specimens of existing species of *Libellulidæ* in the collection of the British Museum, decided that it belonged to the genus last named (*Æschna*). It will be seen from the figure that the wing is in a very fine state of preservation, its delicate reticulation being as perfect as that of a living dragonfly.

The species to which this dragonfly belonged has doubtless been long extinct; and its nearest living allies would probably be found in tropical or subtropical countries, the climate of which more resembles that prevailing in this country at the period when this insect existed. That a much warmer climate then prevailed in this country than is at present enjoyed is evident from the plant remains of these leaf beds, which, according to Lyell, "remind the botanist of the types of tropical India and Australia."

The Avenue, Surbiton Hill.

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. Kirby,
Assistant-Naturalist in Museum of Science and Art, Dublin.

No. X. NYMPHALIDÆ—NYMPHALINÆ. Genera allied to VANESSA.

The first genus, *Araschnia*, contains the smallest European species of the group, *A. Levana*, Linn., remarkable for the dissimilarity of its broods. It is popularly called the "Map" in France and Germany, perhaps on account of the sharpness of its markings. One or two other species have been described from North-eastern Asia, but are perhaps not truly distinct.

The next group, *Symbrenthia*, is East Indian, and includes a few black species, banded with rich tawny. The fore wings are marked with a band in the cell, and a short oblique one across the tip; and the hind wings (which are angulated, and have a strong projection in the middle) have two bands, the uppermost continued across the hinder angle of the fore wings. *S. Hyppoclus* has a tawny under side, with a reddish brown oblique stripe running from the middle of the inner margin of the hind wings towards the hind margin of the fore wings; towards the tail it is dusted with pinkish gray and greenish. *S. Hypselis* is of a richer tawny above, and pale yellow, more or less varied with orange, and reticulated with black below; towards the hind margin there is a row of large black conical spots, bordered with yellow and black, and dusted with metallic-green. The species expand nearly two inches.

The genus *Hypanartia* is South American or African, and the species expand about two or two and a half inches; the fore wings are generally slightly truncated at the tips, and sometimes concave below; and the hind wings are produced into a short tail. Several species, such as *Lethe*, *Godmani*, and *Zabulina*, are tawny or fulvous, with the tip of the fore wings broadly black; in *Lethe* the tip is spotted with fulvous, and in the others with white; but the fulvous portion of the fore wing is divided by an oblique black band in *Zabulina*, which is not the case in *Godmani*. *H. Kefersteinii* is dull reddish instead of fulvous, with white spots on the black tip; and *H. Dione* is dull yellowish brown, with transverse black stripes, and a small, oblong, transparent spot in the middle of the fore wings, and one or two transparent dots nearer the tip; on the hind wings there are one or two black spots, scaled with blue towards the hind margin. *H. Hippomene*, from Natal and Madagascar, exactly resembles a small orange-banded *Pyrameis Atalanta*, with tails.

The species of the first section of *Vanessa* (*Grapta*) are most numerous and varied in North America, where the larger species, such as *Interrogationis*, expand nearly three inches. The Japanese *V. C-aureum* has the inner of two marginal dark bands on the hind wings dusted with blue. The typical section of *Vanessa* is common in Europe, Asia, and North America, but is not numerous in species, and most of them closely resemble our own *Urticæ* and *Polychloros;* but the Mexican *Cyanomelus* is wholly bluish green; the East Indian *Charonia* is greenish black, with a broad greenish blue submarginal band on all the wings; the Japanese *V. No-Japonicum* resembles this, but the band is narrower and bluer, and there is a large white spot on the costa of the fore wings, followed by a small one nearer the tip. The North American *V. Milberti* resembles *V. Urticæ*, but has only a submarginal tawny band on all the wings, which is bifurcated on the costa of the fore wings; the latter are also marked with two reddish spots in the cell.

The genus *Pyrameis* is also represented in all parts of the world, but by very few species, most of which resemble our own common European species. All the American species (*Atalanta* excepted) closely resemble our own *Cardui*, from which the common North American *P. Virginiensis*, Drury (= *Huntera*, Fabr.), may be distinguished by the under side of the hind wings, which is reticulated with yellowish, and marked with two large eyes only. *P. Carye*, which is common throughout Western America, more resembles *Cardui*, but is smaller, with fewer black spots towards the tip of the fore wings. The Royal Dublin Society has a specimen of *Carye*, marked "China;" which is probably an error. I record it, however, as the occurrence of this species in China is not impossible, and, if confirmed, would be a matter of some interest. The Brazilian *P. Myrinna* resembles *P. Virginiensis*, but is much more richly coloured, and the space occupied by the submarginal eyes on the upper surface of the hind wings is filled up by a broad brown band. Of the species allied to *Atalanta* the most interesting are *Indica*, Herbst. (*Callirhoe*, Hübn.), from the East Indies and Canaries, which resembles a pale *Atalanta*, with a broad tawny band on the fore wings, marked with three black spots on the inside; *P. Gonerilla*, from New Zealand, which has a broad red band on the hind wings, marked with four black eyes with blue pupils; and *P. Tammeamea*, Esch., a large and richly-coloured species from the Sandwich Islands. *P. Itea* is reddish or greenish tawny at the base of the fore wings and on the hind wings, except at the costa and hind margin; the basal colouring of the fore wings is bounded by a very large, oval, yellow spot; the rest of the wing is black, with some small white and yellow spots near the tip: it is an Australian insect, and resembles no other species.

I have not been able to complete the subject of the genera allied to *Vanessa* in the present paper, and shall have to resume it in the next.

NOTE ON CERTAIN INSECTIVOROUS PLANTS.

By G. B. Corbin.

It is well known that the above subject has excited some considerable degree of interest within the past few years, and especially since the publication of Mr. Darwin's book treating of the subject. Few readers of the 'Entomologist,' especially those who have visited the New Forest, are unacquainted with the insectivorous properties of the sundews (*Droseraceæ*), and the tenacity with which the viscous matter exuding from the glandular hairs, with which the leaves are encirled, entrap and hold the unfortunate insect that comes within reach. These are not of the smaller kinds only, but sometimes—as my friend the Rev. H. M. Wilkinson informs me—insects as large as a dragonfly are caught, and their juices assimilated to the plant's well-being; or, again, the butterwort (*Pinguicula*) acts in a somewhat similar manner; whilst in the water the bladderworts (*Urtricularia*) have an equally wonderful property of entrapping small water-slugs and insects, and, as Mr. Darwin propounds, thrives upon such fare. Certain it is that small creatures are often found inside the bladder-like processes with which the last-named wonderful class of plants are provided; but how much the presence of the insects in such a situation contributes to the plant's well-being I leave for others to judge. In the case of the sundews it is very evident that the plant absorbs or digests the softer portions of the imprisoned insect, as the dried and rejected skeletons may sometimes be found almost covering the leaves, and the so-called digestive properties of the plant may be proved by placing one insect within its grasp, and killing another insect of the same species and placing it out of reach on some object near. It will be seen that the insect upon the sundew is skeletonised and sucked dry in a comparatively short space of time, whilst the other dries in the same manner as our cabinet specimens. In the instances above cited the insects seem to have been the unwilling prisoners of the plants retaining them; but other instances have come under my observation where the insects appear to have voluntarily settled upon the plant and died.

A few years ago I saw a plant in the New Forest, some species of dead nettle, with many insects attached to its leaves; and last year, in Devonshire, I saw a somewhat similar occurrence, only that the plant was, I believe, akin to the mullein. The leaves of the plants in both cases were beset with vegetable hairs, and the insects might have been partly detained by them, but they were as perfect as any in our cabinets. But the most remarkable instance, which induced me to begin this note, came under my observation last July, as follows:—I was strolling in the meadows by a broad ditch where an abundance of plants common to such situations were growing, as figwort (*Scrophularia*), hemp agrimony (*Eupatorium*), mugwort (*Artemisia*), &c., and my notice was attracted to the number of flies that were settled upon the last-named plants; and on making a closer inspection I was much surprised to find most of the insects were dead. These were attached to the plants in various situations, but in many, if not in all, cases the insect seemed to have settled thereon from choice; some had clasped the points of the leaf, whilst others seemed to hold the smaller stems of the branch in their embrace. Many of the insects were quite perfect, but others were broken from the motion of the plants caused by the wind. At first I thought the smell of the plant had attracted and killed them; but has it ever been proved that this plant is in any way poisonous to insect life? The most remarkable part of this case is that the insects were to be seen only upon the mugwort, and this only for about five or six yards in extent, whilst other plants growing in the vicinity were free from them. It is true I saw a few scattered individuals upon plants of mugwort outside this "charmed circle," but within the space above indicated I saw thousands of defunct Diptera and other insects. I picked some portions of the plants, and showed them whilst fresh to Mr. Wilkinson, who, no doubt, can vouch for the correctness of what I describe. It must be understood that the insects I saw had not died from the attack of a fungoid growth such as we sometimes see, but they appeared to be quite fresh, and for the most part perfect. Has any other similar occurrence come under the notice of other readers of the 'Entomologist,' and if it has, what cause, or combination of causes, was supposed to have led to such an effect? I may mention that the majority of the insects I saw belonged to the yellowish brown looking creature (*Scatophaga stercoraria*) so commonly found on cow-droppings, and the like; but this to me was not so very peculiar, since the insect must be as common, or even commoner, than any other in a locality where cattle were continually grazing.

Further notes on this subject from other localities would, I am sure, be interesting to others as well as myself.

Ringwood.

MICRO-LEPIDOPTERA BRED, 1877 AND 1878.

By J. H. Threlfall.

The larvæ of *Gelechia viscariella* were very abundant in the tops of a Lychnis at Wyre, and in various localities near Preston, during April and May, 1877; but this year they are almost entirely absent; and, strange to say, the plant itself is very scarce where last year it abounded. The perfect insects emerged in limited numbers during July, the pupæ being very much infested with ichneumons.

On May 13th, 1877, I collected roots of sea plantain on the banks of the Wyre for larvæ of *Gelechia instabilella*, which mine in the roots, and, as far as present observation goes, not in the leaf or stem. From these emerged a dozen imagos of *G. instabilella* about the middle of July; and to my surprise, on June 30th, one specimen of a little *Gelechia*, unknown to me, and which Mr. Stainton pronounces to be probably *G. immaculatella.* Larvæ found mining in the leaves of *Aster tripolium*, and supposed to be the same insect, turned out to be *Gelechia ocellatella;* thus giving another food-plant, and even manner of feeding, to this insect.

At Morecambe, on the cliffs, where *Genista tinctoria* grows, larvæ of *Anarsia genistella* were feeding in the shoots; but this insect appears so like the common form, *A. spartiella*, that I am inclined to refer the difference in size and colour to the more succulent properties of the food-plant, just as *Depressaria costosella* is more deeply marked with reddish under the same conditions. The larva was not compared with that of *A. spartiella*, nor indeed examined with the care due to it. On the same day and at the same place (June 8th) *Plutella annulatella* in the larval state were common in *Cochlearia anglica:* they emerged in the middle of July.

At the latter end of May, whilst collecting larvæ of *Coleophoræ* on the willows, at Farington, my attention was directed to the twisted condition of the shoots of *Lotus corniculatus*, on the railway bank close by. Thinking this was owing to larvæ of some *Sciaphila* I neglected to gather many at the time; but afterwards looking in the tin in which they were placed I perceived a *Gelechia* larva belonging to the *Tæniolella* group, but darker. At the latter end of June one imago of a *Gelechia*, unknown to me, appeared above the rubbish; and on reference to Mr. Stainton he pronounced it to be probably an European species, *G. cincticulella*, which feeds on the Continent on *Genista*. I visited the locality this year, but only obtained one larva, which, unfortunately, died.

Larvæ of *Coleophora Wilkinsonella* began to feed on birch, at Witherslack, about the beginning of July, and continued to do so, at intervals only, until September, when they hybernate full fed, and, if brought into the house early in the spring, they will walk about, as if seeking for food. They, however, will not feed, but change into pupæ, and emerge about the middle of June. This is a similar habit to *C. limosipennella*, which with us never emerges in autumn, but feeds on through the autumn, hybernates, and emerges a little later in the year than *C. Wilkinsonella*. It also feeds on birch.

After very patient and repeated search at length larvæ of *Depressaria capreolella* were discovered feeding on leaves of *Pimpinella saxifraga*,—not on the radical leaves, however, but on the higher shoot. They are deep green, with black heads; and, through the plant being buried amongst larger herbage, are very difficult to find. A few perfect insects emerged early in August. They feed during the first and second week in July.

In July, 1877 and 1878, I first had the pleasure of finding cones of *Gracilaria populetorum* on birch. At the former date one insect was bred from a miscellaneous collection of buds, mined leaves, &c.; but this year, by observing the different modes of feeding adopted by the larvæ on the birches, I succeeded in taking about three dozen cones, which occupy an entire leaf, and inside which a green, rather transparent larva was feeding. These larvæ changed to very long, taper, light green pupæ, from which emerged, in all, only five imagos of *G. populetorum*, and about eighteen or twenty large ichneumons. This accounts for the comparative rarity of the insect.

Some years ago Mr. Hodgkinson bred a few *Asycha profugellæ* from seeds of gentian; and, as he had afterwards failed in another attempt, I tried other seeds, such as *Pimpinella saxifraga*, wild carrot, &c. On September 29th these were placed in a flower-pot, and exposed all winter; and to my satisfaction, between July 1st and 30th about two dozen imagos appeared, in company with the Tortrix, *Semasia rufillana*, and *Œcophora flavimaculella.*

Preston, August, 1878.

ACORN- AND BUD-GALLS OF QUERCUS CERRIS.

By E. A. Ormerod, F.M.S.

In the 'Entomologist' (Entom. x. 42) I drew attention to some specimens of a minute bud-gall found in the previous year on the "Turkey oak" (*Quercus cerris*), and its variety the "Lucombe oak," at Kew: few in number and then deserted, but of some interest to record as soon as secured, as being the first-known instance of Cynipideous gall attack to this species of oak in Britain. Since then, in the spring of 1877, I found a few specimens of the gall with the insect developing; but it was not till May 3rd of the present year that I was able to secure sufficient specimens of the gall, with the contained gall-maker, as to show it to be an *Andricus*, but apparently of a species hitherto undescribed.

The five specimens still in my possession all turn out on examination to be males. These are approximately one-sixteenth of an inch in length; head, body, and abdomen dark brown; tibia and tarsi yellowish brown, with femora of the two hinder pair of legs of a darker colour, and the antennæ of a full brown, darker towards the apex; wings colourless throughout, with slightly tinted brown nervures.

The figure given (Entom. x. 43) represents the gall in the most perfect state as then found, free from the protecting processes which had gradually fallen. Fig. 1 now gives a magnified view of the gall cluster in its healthiest and most vigorous form amongst the scales, young leaves, stipules, and stipule-like processes in the axils of the successive leaves along the shoot; these clusters usually consisting of about three galls placed separately, but occasionally adnate to each other; ovate-obtuse in shape, but somewhat flattened on one side; the wall of the single-chambered cell flexible and flocculent outside: when examined under a moderately powerful magnifier the galls may be found (as in the figure) placed at intervals along an abortive stalk, each with one or more stipule-like process at its base.

Fig. 1.

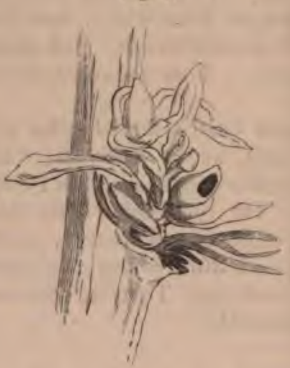


Fig. 2.

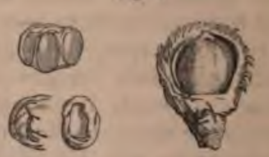
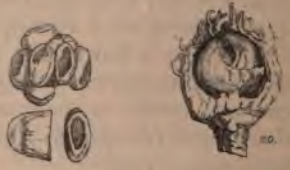


Fig. 3.



The appearance of this gall has hitherto been entirely limited to one tree of Turkey oak, and a very few specimens (found in 1876) on a Lucombe oak, also at Kew; and it is somewhat singular that acorn-galls, of which figures are given (figs. 2, 3), should occur on these two individual trees, and, as far as has at present been observed, on no others.

The acorn-galls of the two trees differ slightly in the individual cells of the aggregate gall, being rather more numerous and more irregularly placed in that of the Turkey oak than of its sub-variety; but I do not see any essential difference between them. In each instance the gall-mass occupies the whole of the inside of the stunted acorn, and is formed of an aggregation of cells, occasionally separable, but more commonly firmly grown together, this mass being brown outside from the adherence of the outer pellicle of the acorn, and either smooth or irregularly lobed, or with regular lobes running from end to end, according to the more or less regular disposition of the cells. These cells are single chambered, with hard woody walls, and smooth light-coloured interior.

On February 18th I found a few of these gall-deformed acorns, which had fallen from their shells, and had the cells empty and apparently recently perforated, beneath one of the old trees of *Quercus cerris*, at Kew; one specimen, with undeveloped larvæ in the cells, alone remaining in its acorn-shell and cup. The galls in this case were all about a quarter of an inch or more in diameter, formed of from about seven to ten cells; each cell oval in shape, where the pressure of the surrounding mass allowed it characteristic development, but frequently compressed, so as merely to show its rounded extremity. In the most perfect form the cell appeared suddenly flattened towards one extremity, and at the other frequently marked by an oval depression (sketched, magnified, see fig. 2, 3) extending about half across it, surrounding a slightly raised convex spot,—a peculiar marking I have not noticed in other galls. The exterior of the cells, where exposed, is shaggy, and sometimes marked by irregular striæ; and the aggregate mass much resembles in its irregularly lobed form a miniature raspberry.

In the case of the Lucombe oak the galls were rather smaller, so as to be entirely included in the acorn-cup, which is abnormally contracted into a globular form, closed at the top; the gall also is composed of rather fewer cells, and these are occasionally separable, and somewhat more symmetrically arranged, and occasionally with the peculiar depressed mark. In other respects, both of form and colour, shagginess of exposed surface, and crisp woody walls to the single-chambered cells, the galls exactly correspond, and appear to me the work of one gall-maker. The very great number of gall-diseased acorns on this tree was also observable, as from the beginning of October of last year till the middle of December the ground was well strewed with the fallen crop, and every acorn examined invariably showed gall presence, and commonly contained larvæ,—white, thick, and fleshy,—but which, though apparently perfectly healthy and filling their cells, still (on July 11th) gave no sign of passing into a state of pupation.

The galls correspond in so many points with the description of those of ***Andricus glandium***, given by Mayr (translated on the opposite page), that I conjecture them to be similar, and the greater distortion of the acorn in the specimens before me merely to be the result of the whole of the interior of the acorn being occupied by the gall-cells, instead of only a portion (as in his figured specimen); and the larvæ also coincide with those mentioned in the long period elapsing before development.

It is remarkable that the acorn and the bud-galls should both occur, as far as at present seen, on these two trees, and no other, and the departure of the insect from the acorn-gall (in the case of some specimens on the ***Quercus cerris***) having taken place apparently just before the time when the eggs for the bud-galls would (conjecturally) be deposited, suggests whether further search may not give an instance of the alternations, now considered proved by various observers.

I should add that since writing the above I am indebted to Herr von Schlechtendal (to whom I had forwarded specimens) for his opinion that the bud-gall corresponds with that of ***Andricus circulans*** of Mayr.

DESCRIPTIONS OF OAK-GALLS.

Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen.'

By Edward A. Fitch.

(Continued from p. 183.)

91. *Spathegaster glandiformis*, Giraud.—This gall appears at the beginning of May on the fertile flowers of the Turkey oak. In the early stage it greatly resembles a normal fruit bloom, and it is almost impossible to recognise it. By the middle of May it becomes more or less rosy, and soon begins to get much larger than the ordinary fruit; gradually the galls swell to the size of a pea, or even a hazel nut; the

linear apical leaves lengthen, and mostly grow uniformly from the whole exterior of the nearly globular gall. It seldom remains quite green; the apical leaves generally redden, or the whole gall becomes reddish in colour. The style, with its accompanying depression, is always recognisable, even when it does not appear set on opposite the footstalk. In section it shows that the involucre, as well as the lower part of the germen, is enclosed in a green, soft merenchyma, which contains several larva chambers. The fly appears at the end of May or beginning of June, although I once obtained them as early as May 19th.—G. L. MAYR.

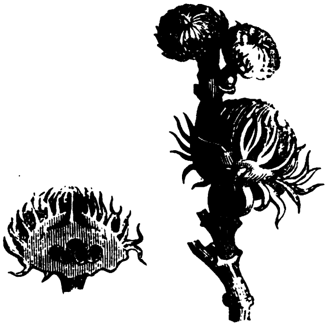


Fig. 91.—Gall of *Spathegaster glandiformis*, and in section.

This inconspicuous and early Turkey oak gall is not likely to occur in Britain. *Synergus Thaumacera*, Dalm., *Ceroptres Cerri*, Mayr, and *Megastigmus dorsalis*, Fabr., were bred sparingly with the gall-maker in May or June of the first year.—E. A. FITCH.

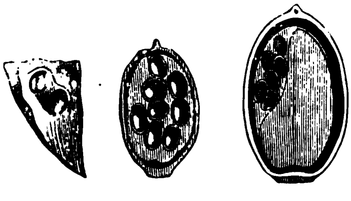


Fig. 92.—Sections of acorn, with galls of *Andricus glandium*.

92. *Andricus glandium*, Giraud.—If we cut through the fallen acorns of the Turkey oak in autumn we often find in their interior a remarkable thickening of the brown shell,

which takes the place of part of the nut, and in section show white, hard, oviform or polyhedral inner galls, of about the size of a hemp-seed. These are joined together with slightly denser tissue, and in each there lies a gall-fly larva. Sometimes we find the acorn-shell only thickened by a single gall at a place, but sometimes the seed is wholly appropriated, and the whole acorn filled with these galls. Herr von Haimhoffen first observed some females from three-year old galls. Of galls collected by me on September 28th, 1869, I have kept some quite dry, and others I have laid in water for a few hours from time to time: those which I collected early last autumn I have kept separate from those in sand, which is kept moist. From none of these galls have I yet obtained an insect, although in the greater part of them the larvæ are still living.—G. L. Mayr.

This acorn-gall has rather puzzled me for some time. It is doubtfully British. On October 26th, 1874, Mr. G. B. Rothera wrote me that he had found an acorn-gall at Ollerton (Nottinghamshire) on September 28th, 1873, as follows:—"My acorn-gall is certainly not that figured by Mayr, nor does it agree with the description given by Giraud, which applies to a multilocular gall. The one I found consisted of a thin, shelly, unilocular gall, lying loosely within the acorn case, and containing a large, fat, white, mandibulate larva, closely resembling that of *Cynips Kollari*. Unfortunately I damaged the larva in cutting open the gall, so that there is no chance of hatching the insect. If the larva had been a mere nomad, feeding upon the seed-lobes (cotyledons), these would have shown the usual division; instead of this, however, we had a perfectly closed chamber, with thin nut-like walls." In the early summer of 1875 Mr. Cameron collected two or three galls in the neighbourhood of Glasgow, which he referred to this species. These were from the common oak; and as the gall-maker has not been bred they cannot be referred with certainty to the *Quercus cerris* species. Mr. Cameron bred a specimen of *Synergus vulgaris* from one gall: this is given by Dr. Mayr as an inquiline in the galls of *A. glandium*. On the other hand, last autumn, guided by Miss Ormerod, I collected a quantity of the small acorns of *Quercus cerris* var. *Lucombeana* from Kew Gardens, almost the whole of which were tenanted by larvæ: I at first thought these might be coleopterous *Balanini*. A description and note on these galls appears in the present issue (Entom. xi. 201): they somewhat differ from Mayr's figure, but like the others are doubtfully referable to *A. glandium*. Dr. Giraud says the galls form a hard mass *between* the shell and the nut of the acorn. I may here state that in the autumn of 1875 I received, from the late Edward Newman, a curious, but true, gall, actually formed in a common nut (filbert). It was between the nut, with a very marked depression, and the shell near the base. I believe it came from Mr. Bond.—E. A. FITCH.

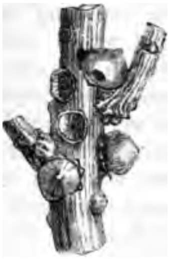


Fig. 93.—Galls of (?) *Cynips ramicola.*

93. ***Cynips ramicola***, Schlechtendal.—On plate 7 of this work there is a typical specimen of this species, for which I am indebted to Herr von Schlechtendal. I considered it probable that these bark-galls were immature, and that they were the same as some which, in my collection, are mixed with galls of *Aphilothrix Sieboldi*. They occur on the same bough; and at plate 1, figure 5, are figured in the centre of the upright twig. [See Entom. vii. 52.]—G. L. MAYR.

After noticing the, to him unknown, ? *Cynips superfetationis*, the gall of which was described by Giraud as resembling a small acorn grafted on another, and occurring on *Quercus pubescens* and *Q. pedunculata*, Dr. Mayr, in an appendix, gives a little further information on one or two included species, and describes four others. The first, *C. ramicola*, belongs to the puzzling little group of bark-galls, which includes the single-celled form of *A. radicis*, *A. corticis*, *A. rhizomæ*, and *A. Sieboldi* (= *corticalis*); *Radicis* occurs in Britain commonly; *Sieboldi* is widely distributed, and not rare; whilst *Corticis* has lately been added to our fauna (Entom. x. 165). Dr. Adler attempted to show that *A. corticis* and *A. rhizomæ* were one species; but Dr. Mayr tells us that he only refers to two forms of *A. corticis*, and did not know the gall of *A. rhizomæ* at all.—E. A. FITCH.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

NOTE ON THE MEADOW-BROWN (SATYRUS JANIRA).—This species having been extremely common here during the whole of July—four or five times more plentiful than the "whites," taken collectively, at least in the earlier part of the month—I have observed a few points in its habits, which may be worth putting on record. It visits, as far as I have seen, exclusively hedgerow-flowers, such as the blackberry blossom, the wild roses (as long as they remained), the thistles, the privet, and a white umbelliferous flower very abundant along the hedges in this district. I have repeatedly observed one and the same specimen fly from a blackberry flower to a thistle, or *vice versâ;* but I never saw one of them visit red and white clover, even after sitting on the ground close to the plants. I have watched one fly across the corner of a potato field and repeatedly settle upon the leaves, but it never visited one of the flowers. This insect has some protective habits: when sitting upon a flower, or on the ground, with its wings closed, the under side of the anterior pair would be very conspicuous, on account of the eye-spot at the outer angle; it therefore very frequently lowers the anterior wings, so that they disappear between the posterior pair, and in this attitude it may well be taken, by man or bird, for a discoloured leaf; when sitting upon the ground, also, it very generally leans on one side, so that its closed and erected wings, instead of standing at right angles to the ground or other surface, "heel over" at a very acute angle. In this position the insect's resemblance to a withered leaf is much increased. I have seen other butterflies assume this attitude, but none so generally. As might be expected the meadow-brown is very bold, hovering round, and even settling upon, persons who walk leisurely through its haunts; so it may easily be captured with the finger and thumb when at rest upon a leaf. Like most of its congeners it appears early in the morning, retires comparatively late in the evening, and is less apt to vanish on the approach of heavy clouds than the members of the genus *Vanessa.* It may be counted among the many species which will settle upon dung, recent or decayed, and imbibe its juices.—J. W. SLATER; 3, Bicester Road, Aylesbury.

NOTE ON ARGYNNIS PAPHIA.—On August 7th, in an enclosure in the New Forest, *Argynnis Paphia* was in abundance, but good specimens were hard to find, being so late in the season. Observing two which looked good specimens flying about near one another I netted them, and found one was a female, evidently just emerged, and the other a male, in only fair condition. I killed the female, and let the male go. Noticing, however, that the male continued to fly round my head I held out the female in my hand: the circle of flight of the male became smaller and smaller; and at last the insect alighted on my hand, where it sat for some little time, until I moved off to show it to a friend who was with me. It then flew off, but again alighted; and we watched it on my hand for a minute or two. I then took it by the wings and threw it into the air. It flew overhead for a little time, but then seemed to have lost the attraction, and flew away. I may mention that at the same time and place I took one of the variety *Valezina*, and missed another; my friend also took one the next day.—[Rev.] W. W. FOWLER; Repton, Burton-on-Trent.

ON HESPERIA ACTÆON, &c.—This little butterfly has been very scarce this year, as well as all other insects; but last year it was in greater profusion than I have ever seen it. The first I captured was on June 20th, and the last on September 4th. It is more widely distributed than is commonly supposed, as I have taken it in various places on the Dorset coast, from Swanage to Preston Preventive Station, which is not far from Weymouth. At Portland I have taken only a couple of *Acidalia degeneraria*, three of *A. rusticata*, and three of *Eudorea phœoluca*, besides several of *Psylla artemisiæ*. These species are almost, if not entirely, confined to Dorsetshire, as far as the British Isles are concerned, with the exception perhaps of *A. rusticata.*—C. W. DALE; Glanville's Wootton, August 2, 1878.

VARIETY OF LYCÆNA ALEXIS.—Whilst collecting in the Isle of Wight I captured, on June 6th, an hermaphrodite specimen of *Lycæna Alexis;* the two wings on the left-hand side being the ordinary male type, whilst the right-hand side has the female markings clearly defined, the red marginal spots being very distinct. The female side of the specimen is smaller, and the wings are rounder than the male side. It was flying in a chalk-pit at Arreton, together with a great many common blues and heaths.—ARTHUR J. ROSE; Mutlah Lodge, College Avenue, Hackney, June 20, 1878.

LARVA OF NOCTUA RHOMBOIDEA.—As nearly three years have now elapsed since the autumn when I had the good luck to obtain eggs of this species (in that season one of the lions of Lyndhurst), and as—though I have patiently waited for its advent—no description has emanated from the pen of those entomologists who usually describe larvæ, although the larva does not resemble the description given of it in Newman's 'British Moths,' I cannot but suppose that they have failed to obtain it, or that they have confounded it with that of *Noctua baja*, which it closely resembles. I therefore venture to offer to the readers of the 'Entomologist' the following notes. In the middle of August, 1874, having captured at sugar some worn females of this species, in Hurst Hill Enclosure, New Forest, I confined them, along with some twigs of bramble, in a bandbox covered with leno-muslin, and they deposited eggs pretty freely, not on the plant, but in clusters on some projecting splinters of wood, and on the leno. The eggs were of the usual *Noctua* form, and pale lemon-yellow in colour, and hatched at the end of the month. The young larvæ at first resembled those of *N. festiva*, but after a moult they assumed a dull opaque tint, somewhat between olive and Prussian green, with the five lines tolerably well defined, paler than the ground colour, the spiracular especially conspicuous and whiter than the rest, its upper boundary defined by a thin dark line; their heads ochreous-brown. They fed at first on mint, but during the winter I supplied them with carrots; and the only three which I retained through hybernation attained a very large size, and buried by the end of the first week in February, 1875. The full-fed larva is one inch and four lines in length, at rest; one inch and nine lines when fully extended, when it appears rather more elongate and less dumpy than that of *N. baja*. It is plump, attenuated in front; the 12th segment tumid dorsally, and the segmental divisions tolerably deeply incised; the head and the usual trapezoidal and other dots each bearing slender whitish hairs. The head is sienna-brown reticulated with black, with two crescentic black marks (one on each side of the median suture) placed back to back, and having between them a pale line forked at its lower extremity. The plate on the 2nd segment is raw-sienna-brown, with the commencement of the dorsal line whitish, broad, and well marked; the subdorsal indistinct, or sometimes absent. The body is smooth and soft, and its colour is a mixture of different tints of brown and dirty ochreous, sometimes even (as in *N. baja*) approaching to a pale rose-madder, at other times of a more uniform dingy sepia or umber-brown, irrorated and reticulated with smoke-colour. The whole surface has a peculiar streaky appearance caused by the greater boldness of the dusky reticulations, as compared with those in *N. baja;* these on the dorsal surface mass themselves into a series of lozenge-shaped marks, more or less distinct, each defined posteriorly by a slightly-darker V-shaped shade, the apex (except on the 12th segment, where the lozenge becomes a triangle) pointing backwards. On the 11th and 12th segments the V's are replaced by a pair of dark brown triangular marks. The medio-dorsal and subdorsal lines are ochreous and interrupted; the former passes through the centre of the dorsal lozenges and, in the centre of each segment after the 4th, through a pair of short, curved, ochreous marks, edged anteriorly with smoke-colour: these marks are nearly erased in the dark specimens, but conspicuous in the paler ones. The subdorsal lines are somewhat dilated on the posterior edge of the hinder segments, and are united at the hinder edge of the 12th segment by a transverse ochreous band. There is a slender, whitish, spiracular line sharply defined along its upper edge by a broad dark shade, scalloped above the convexities of the scallops upwards, and followed below by a broad band, grayish or reddish ochreous, mixed with dirty whitish. There is behind each spiracle an oval, dark brown blotch, and a distinct black dot just above the spiracular line in the centre of the 3rd and 4th segments. The ventral surface and claspers are grayish ochreous, slightly tinged with the prevailing ground colour; the legs ochreous-brown. Spiracles (in the paler larvæ) ochreous, in a delicate black ring; in the darker larvæ dark brown, in an ochreous ring. Usual spots ochreous, each accompanied by a dark brown dot. I may mention that in the bright-coloured varieties of *N. baja* (I have had them of a deep orange) the subdorsal lines are canary-yellow; in the same varieties of *N. rhomboidea* they are of the usual dull ochreous.—BERNARD LOCKYER; 27, King Street, Covent Garden, London.

ACHERONTIA ATROPOS AND ACRONYCTA ALNI.—I have obtained, since July 30th, about a dozen larvæ of *Acherontia Atropos* found feeding on *Lycium barbarum* (tea tree); also upon privet: two were the dark brown variety. On August 12th my wife found a larva of *Acronycta alni*, at rest, on dog-rose; it has since fed up upon pear leaves, and is now a pupa; it spun up amongst the loose leaves. One I got last season produced a fine female specimen on the 27th of last May.—G. BAKER; Ashby Road, Burton-on-Trent.

Acronycta alni.—A friend brought a fine full-fed larva of this moth to me recently. He found it feeding upon a lime tree, in Escrick Park, on July 25th.—T. Foster; 6, Wren Lane, Selby, Yorks, August 5, 1878.

Zygæna filipendulæ.—Out of about a score of chrysalids one emerged in July with the spots and under wings a beautiful pale yellow.—E. D. Fish; Higher Tranmere, Birkenhead.

On the disappearance of Orgyia cœnosa from Wicken Fen.—Sixteen years ago this species was in the greatest abundance in the larva, pupa, and imago states, at the same time: I found them all over the fen. I have visited the fen several times in different years since, and they have been getting scarcer every time. The fen men have not now seen the larvæ for three or four years; but I have known the time they used to find them by hundreds. The last that I can hear of this species being taken was about three or four years ago, by Mr. Wheeler, at light: there have been none seen since. In 1875 and 1876 the whole fen was covered with water, and it is probable that the hybernating larvæ were drowned: the fen was covered with water for over a month at the time. I have never found this species in any of the Norfolk or Suffolk fens, and am afraid it will soon become, like *Liparis dispar*, a thing of the past in this country.—T. Eedle; 40, Goldsmith Row, Hackney Road.

Eupœcilia Geyeriana and Gelechia palustrella.—During a short stay in the Norfolk fens last month I secured a fine series of *Eupœcilia Geyeriana*: they fly just before dusk, and are very active on the wing. I also took four examples of *Gelechia palustrella*: these came to the light-house, which I carry in the boat, at about one o'clock in the morning.—E. G. Meek; 56, Brompton Road, August 2, 1878.

Clothes-Moths: Life-history, and how to Destroy them.—The name clothes-moths is applied to several distinct, but similar, species of minute moths belonging to the family Tineidæ, which, in their larval state, are very destructive to woollen goods, fur, skins, feathers, and similar substances. Among them may be mentioned the clothes-moth (*Tinea vestianella*), the carpet-moth (*Tinea tapetzella*), the fur-moth (*Tinea pellionella*), and the hair-moth (*Tinea crinella*). These Tineidæ have slender bodies, and lanceolate deeply-fringed wings that expand six-tenths or eight-tenths of an inch. The antennæ and palpi are short and thread-like, and there is a thick orange or brown tuft on the forehead. The colours range from buff to drab and dark gray. The eggs are laid in May and June (the moth dying immediately afterwards), and hatch out in fifteen days. The young worms at once proceed to work, gnawing the substances within their reach, and covering themselves with the fragments, which they shape into hollow rolls and line with silk. These rolls are by some carried on their backs as they move along, and by others fastened to the substance they are feeding upon, and they are enlarged from time to time by additions to the open extremities, and by portions let into the sides, which are split open for this purpose. In such ambush the worms carry on their work of destruction through the summer, rest in seeming torpor during the winter, and change to chrysalids early in the spring. They transform again in twenty days, and issue from their shelter as winged moths, to fly about in the evening till they have paired, and are ready to lay eggs. Then follows an invasion of dark closets, chests, and drawers, edges of carpets, folds of curtains, and hanging garments; and the foundation of a new colony is swiftly laid. The early days of June should herald vigorous and exterminating warfare against these subtle pests. Closets, wardrobes, all receptacles for clothing, should be emptied and laid open, their contents thoroughly exposed to light and air, and well brushed and shaken before being replaced. In old houses, much infested with moths, all cracks in floors, wainscots, shelves, or furniture, should be brushed over with spirits of turpentine. Camphor or tobacco should be placed among all garments, furs, plumes, &c., when laid aside for the summer. To secure cloth linings of carriages from the attacks of moths sponge them on both sides with a solution of corrosive sublimate of mercury in alcohol, made just strong enough not to leave a white mark on a black feather. Moths may be killed by fumigating the article containing them with tobacco or sulphur, or by putting it, if practicable, into an oven heated to about 150° Fah.—C. V. RILEY. [Extracted.]

[*T. vestianella*, Steph., is a synonym of *Tinea* (*Blabophanes*) *rusticella*, Hb.; and *T. crinella*, Tr., of *Tinea* (*Tineola*) *bisellliella*, Hummel.—ED.]

"A HUNTING WASP.—The following interesting account of a chase between a wasp and a spider has been forwarded to 'Nature,' July, 1878, by Mr. Henry Cecil, who wrote to 'Nature' on the subject (vol. xvii. p. 381):—

"The Piræus, Athens, June 19.

"Dear Sir,—Your letter of April 5th, and the two numbers of 'Nature,' reached this during my absence in Thessaly, which must be my apology for not having sooner replied to your letter. Though more than thirty years have elapsed since the circumstance alluded to, I perfectly remember the curious chase I witnessed of a very large and powerful hunting-spider by a species of wasp. I was sitting one summer's afternoon at an open window (my bed-room) looking into a garden, when I was surprised to observe a large and rare species of spider run across the window-sill in a crouching attitude. It struck me the spider was evidently alarmed, or it would not have so fearlessly approached me. It hastened to conceal itself under the projecting edge of the window-sill inside the room, and had hardly done so when a very fine large hunting-wasp buzzed in at the open window and flew about the room, evidently in search of something. Finding nothing the wasp returned to the open window and settled on the window-sill, running backwards and forwards as a dog does when looking or searching for a lost scent. It soon alighted on the track of the poor spider, and in a moment it discovered its hiding-place, darted down on it, and no doubt inflicted a wound with its sting. The spider rushed off again, and this time took refuge under the bed, trying to conceal itself under the framework or planks which supported the mattress. The same scene occurred here; the wasp never appeared to follow the spider by sight, but ran backwards and forward in large circles like a hound. The moment the trail of the spider was found the wasp followed all the turns it had made, till it came on it again. The poor spider was chased from hiding-place to hiding-place—out of the bed-room, across a passage, and into the middle of another large room, where it finally succumbed to the repeated stings inflicted by the wasp. Rolling itself up into a ball the wasp then took possession of its prey, and, after ascertaining it could make no resistance, tucked it up under its very long hind legs, just as a hawk or an eagle carries off its quarry, and was flying off to its nest, when I interposed, and secured both for my collection. Both insects were rare ones; and during the ten years I collected as a field naturalist in Greece I don't remember ever seeing more than three or four specimens of either that species of wasp or spider. The wasp was a hunting one (a female), about an inch and a half long; a very finely formed insect, which for gracefulness of form and beauty of colouring is entitled to be placed at the head of its species.* The legs of this kind of wasp are very long, and of a dark chocolate-brown; it runs very quickly. The wings are a light brown with dark brown tips, and long and powerful; and the body beautifully mottled with pale yellow and brown. It has very long, fine antennæ. It is not an English species; but probably exists in Spain, the south of France, and Italy. The spider, too, was a rare one: one of the largest Greek hunting-spiders, nearly as large in the spread of its legs as the flesh-coloured tarantula, though without his powerful crab-like pincers. The one I allude to must have covered at least three inches in circumference when its legs were fully extended. It was of a dull mottled brown colour on the upper surface of the body; very difficult to distinguish from the ground. The lower part of its body was, however, brilliantly coloured, the long legs, or arms, being marked underneath with velvet-like-looking black and white rings. The head, thorax, and abdomen, were of a velvety black, the lower portion of the latter surrounded with a bright orange ring. There is only one error in the account given by you in 'Nature,' that is that you were under the impression I told you that kind of spider was the common prey of that species of wasp. You must have misunderstood me. (1.) I do not think that particular kind of spider is sufficiently common for this to be the case. (2.) I never saw a similar conflict of the kind before or after, which, as it was in a room, and not in the grass, where I presume such encounters usually take place, I observed under exceptionally favourable circumstances. I am certain the spider left no web or thread behind it. I cannot be sure, however, that, as it had evidently been attacked by the wasp before entering my room, a small quantity of liquid may not have exuded from its wounds, which may have helped the wasp in tracking it. I have no doubt myself that insects have the sense of smell, and probably much more developed than our own. No one, as you remark, who has sugared for moths, or seen the large *Sphingidæ* hovering over the strongest-scented flower at night, or employed a caged female moth as a lure to her male admirers, can, I think, doubt this. If so, let them put a saucerful of honey in a corner of a room opening into a garden, throw open the window, and see how soon the bees, wasps, &c., will be attracted to the honey. There is a tradition in the East that one of the tests by which the queen of Sheba tried to prove the wisdom of Solomon, was placing on a table before him two bouquets, one of artificial, and the other of natural, flowers, and requiring that he should say which were the real and which the artificial, without moving from his throne. Solomon ordered the windows to be thrown open, and in flew the bees, &c., which went at once to the real flowers. Whether the senses of insects, birds, and what we call the lower creation, are similar to ours in every respect, it is very difficult to say. No doubt a dog, if he could speak, would say a man had not the sense of smell, and would prove that his nose was worse than useless to him. An eagle or hawk would say that men and moles, &c., have only the rudiments of eyes; and so on. Man, with five very imperfectly developed senses (who can say that there are not twenty senses), is the only animal that is dogmatical, and denies all he cannot understand. The oracle of Delphi said 'Socrates was the wisest man in Greece, because he was the only man who knew he knew nothing.'—Yours faithfully, C. L. W. Merlin.

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* The hunting-wasp was, no doubt, a species of the genus *Pompilus*.—F. SMITH.

"To Henry Cecil, Esq., Bournemouth."

Preservation of Epping Forest.—The Epping Forest bill received the royal assent on the 8th August last; and from that day, after a twenty-five years' struggle, a tract of close upon six thousand acres of virgin forest will be preserved for public use. By its provisions what remains of the Forest will be vested in the Corporation of London, for ever, for the use of the commoners and the recreation of the public: thus one of the "happy hunting-grounds" of the metropolitan entomologist is still likely to retain many of its treasures. Its rich insect fauna is constantly referred to throughout our own ten volumes. London naturalists certainly must be congratulated on their city standing alone amongst the European capitals as possessing a virgin forest actually touching its borders (at Stratford). The whole county of Essex was originally one vast forest. Kings Stephen and John were the first to commence its disafforestment, which has gradually been going on to the present day. It is to be hoped that this is now effectually stopped; and that Loughton or Waltham will long continue a favourite resort, not only for the mere holiday-maker and lover of Nature, but for the scientific naturalist.—E. A. F.

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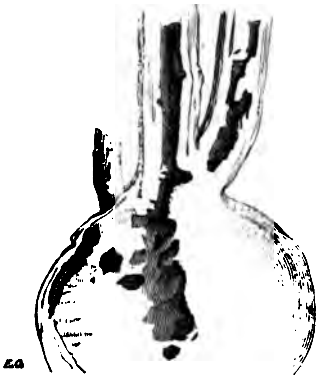
NOTES ON PSYLLIODES CHRYSOCEPHALA.

By E. A. Ormerod, F.M.S.

Fig. 1.



Psylliodes chrysocephala.

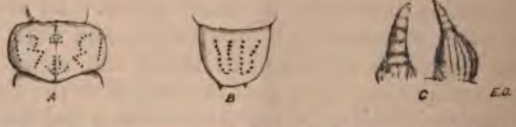
About March 18th of the present year, whilst examining a bed of white turnips running up into flowering stems in my garden, near Isleworth, I noticed that many of the shoots were channelled internally by small grubs. In some cases these galleries appeared only just begun, and were still only horizontal piercings at distances along the stem, with the larvæ occupying more than half the length of the tunnel, but more frequently, judging by the discoloration and the progress of the injury, the work had been commenced some time before at the ground level, and had been carried thence some inches up the stem, occasionally diverging into the petiole of the leaf; and later on (as shown at fig. 1) the larval workings were to be found both in the centre and beneath the rind of the bulb itself.

The bed of turnips, as well as some others in the neighbourhood, proved greatly infested. Of thirteen plants brought in for examination only one proved free from attack, but the larvæ were not numerous in each plant; sometimes as many as three or four were to be found at distances along the galleries; sometimes only a single specimen was discoverable.

The injury being new to me I isolated some of the attacked plants with the larvæ, which developed about the beginning of June into the well-known beetle *Psylliodes chrysocephala*, distinguishable from its near allies the turnip-flea beetles (*Phyllotretæ*), technically, by peculiarities of the antennæ and posterior tarsi, and to general observation by the rather larger size, more robust form, and even greater saltatory powers. As I am not aware that its life-history has been given in England, a short note may perhaps be of interest.

The larvæ varied in size when first seen from just over one-sixteenth of an inch in length to five-sixteenths, apparently the limit of growth, and were white or yellowish in colour, with dark brown mottled head and strongly-toothed jaws. The segments of the body slightly hairy, with transverse rows of minute pale tubercular spots, for the most part armed with a dark brown bristle, and having smaller and paler rows placed between them for a short distance from the caudal segment. The segment immediately behind the head is marked on the upper surface by two triangular patches formed of brown dots placed along the central white line, and by a curved line of dots running longitudinally along each side of the segment; between these and the central markings is an irregular pattern of dots, usually involving in it a V-shape, with the point turned to the central line, as given at A, fig. 2. The upper surface of the caudal extremity is convex, pale brown, glistening, and horn-like, armed at the tip with two minute upturned triangular points, and marked by two pairs of rows of brown spots placed longitudinally, and usually with the inner line of each pair straight, the outer diverging, so as to follow the outline of the segment, fig. 2, B. The caudal foot was extremely strongly developed.

Fig. 2.



On May 21st the larvæ were passing into the pupal state in earth near the turnips, and, in all the specimens observed, lay either immediately beneath the surface or about half an inch beneath, but not in formed cells,—simply in earth, necessarily smoothed by the presence of the pupæ, which were placed indifferently in horizontal or vertical direction.

On May 28th the turnip stems appeared deserted by the larvæ, though a few might still be found unchanged in the earth with the pupæ. The pupæ were of a yellowish colour, about an eighth of an inch in length, and sprinkled with stout hairs, both in transverse lines on the segments and also on the back of the thorax. The shape narrowly oval, tapering gradually to the caudal extremity, and terminated in a somewhat lunate form by two appendages, consisting (as seen magnified) of a bulb narrowed suddenly into a prolonged cylindrical process curved inwards, and slightly tapering to its blunt extremity, the bristles with which the whole appendage is covered being arranged in longitudinal striæ along the bulb, and in successive sheathing rings gradually narrowing towards the extremity on the cylindrical prolongation, much resembling in miniature the sheathing of the flowering stems of some of the *Equisetæ*. Fig. 2, c, gives the appearance of the bulb magnified, and at its side a still more enlarged sketch of the sheaths of the cylindrical prolongation.

On June 3rd the pupæ nearest the surface of the soil had begun to change colour previous to complete development; and on the 21st the perfect beetles were to be found on the surface, the collections of isolated specimens which had been placed in the driest situations, showing the greatest number of beetles. All, with one exception, turned out typical specimens of *Psylliodes chrysocephala*, too well known to require description; the solitary exception, however, proving of some interest as a specimen of the *Psylliodes nigricollis*, considered sometimes rather a variety of the *P. chrysocephala* than a distinct species. The mere finding of this beetle with the others, without having especially observed the individual larva it proceeded from, of course leaves this question still open; but the plants infested with the larvæ having been selected and isolated with great care it points to a similarity in food, locality, and life-history.

Looked at economically the *Psylliodes* presence seems of little moment, except in the decay induced in the turnip bulb, where several larvæ are present; but the vigour of the developed beetle, and great vital powers of the larvæ under injury, might make it an inconvenient guest; and its habits in its early stages lay it so thoroughly open to attack by burning infested bulbs, or throwing the ground open to be cleared by the birds, that its destruction where much present would be a task of little difficulty, and certainly desirable.

Isleworth, September 10, 1878.

DESCRIPTIONS OF OAK-GALLS.

Translated from Dr. G. L. Mayr's 'Die Mitteleuropäischen Eichengallen.'

By Edward A. Fitch.

(Concluded from p. 207.)

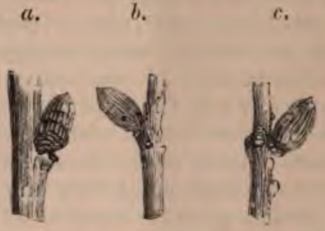


Fig. 94.—Galls of *Aphilothrix albopunctata*: *a.* Collected by myself; *b.* Schlechtendal's type; *c.* Schenck's type.

94. ***Aphilothrix albopunctata***, Schlechtendal.—This gall is developed in April from the buds of the last year's twigs of ***Quercus pubescens***, ***Q. pedunculata***, and ***Q. sessiliflora***. It is elongately oviform,—5 to 6·6 millimetres in length, and 3 to 4 millimetres in breadth,—smooth, green (later often yellowish brown), more or less covered with elliptical whitish spots placed lengthwise. It has at the apex a small (sometimes indistinct), brown, well-marked papilla, and is surrounded at the base with the bud-scales. In section the gall exhibits an outer, at first somewhat soft but quickly hardening, rind, which surrounds the moderately thick-walled, woody, inner gall, and is attached to it. The gall falls from the bud in the first fortnight of May; and according to Schlechtendal the gall-fly emerges at the end of November. As early as 1865 this gall was described by Professor Schenck, in his 'Beitr. z. Kenntniss d. nass. Cynip.' (p. 116); but he only bred *Synergi* from the galls

found by him. I found it myself in 1869 on April 15th; in the following year at the beginning of May; and also this year (1871) on *Q. pubescens* and *Q. sessiliflora*, but have not yet bred the gall-fly.—G. L. MAYR.

I first found the galls of this species in Essex, on July 3rd, 1874, but believe it to be widely distributed in Britain, as it occurs in Mr. P. Cameron's list of Sutherlandshire Hymenoptera. I have collected numerous specimens of these galls in the early summer of every year since, but, like Mayr, have not yet bred the gall-maker. Schlechtendal only bred a single specimen. The insects I have bred have been ***Synergus facialis***, Hart., very abundantly in June and July; ***S. radiatus***, Mayr, with ***S. facialis***, but much more uncommon; ***Eurytoma squamea***, Wlk., commonly; another species of ***Eurytoma; Megastigmus dorsalis***, Fabr., rarely; two, if not three, species of ***Pteromalus; Eupelmus urozonus***, Dlm., rarely in July; and two other species (one, commonly) of ***Chalcididæ***, which are unknown to me. Dr. Mayr says Herr Wachtl bred two specimens of ***Olynx trilineata***, Mayr, from these galls, in February of the second year.—E. A. FITCH.

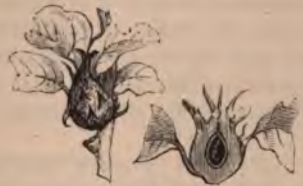


Fig. 95.—Galls of *Andricus singularis*, and in section.

95. *Andricus singularis*, Mayr.—In the early part of June, this year, I found this gall, for the first time, in the neighbourhood of Vienna. It is developed from an axillar, rarely from a terminal, bud of *Quercus cerris*, and consists of a green, more or less globular, swelling, which is thinly clothed with hairs, and is generally of about the size of a pea: from this two to four, but not more, very small rudimentary leaves are developed. If we cut through the gall in a perpendicular direction we see that it consists of a thick-walled cup, the small cavity of which contains a single brown, moderately hard, inner gall, of which the apex only is free above, whilst everywhere else it is enveloped in the green fleshy cup. In rare cases the small twigs continue to grow

from the margin of the cup, and bear leaves. From the collected galls the gall-flies appeared in the middle of June, and I found a gall as early as June 8th, which was already empty: it is, therefore, very possible that the usual flight time is still earlier, for the wet spring of this year retarded the appearance of gall-flies generally. *A. singularis* bites its exit-hole through the upper apical end of the inner gall, so that it is observable without separating the rudimentary leaves. Soon after the emergence of the gall-fly these leaves wither and become yellow, the globular gall shrivels considerably and falls; at least it has done so in many cases, according to my own observations. I at first took this gall for a very small variety of that of *Andricus cydoniæ*, to which it bears a great resemblance, yet it is separable from that species in that it is always much smaller, and because it always contains but a single central inner gall. A comparison of the imagos of the two species leaves no doubt but that they are quite distinct. As may be seen in the figure of the new species the leaf rosette is more or less unconnected with the gall, still it must be placed amongst the bud-galls, for in this case the axis of the bud itself becomes centred in the inner gall. In anatomical structure this gall stands in nearest relationship to that of *Andricus inflator*, differing from it that the inner gall takes up the whole of the small cavity of the short cup, while in the gall of *A. inflator* the inner gall only lies at the end of the large canal-like cavity of the long cup.—G. L. MAYR.

This recently discovered Turkey oak species is hardly likely to occur in Britain. In addition to the gall-maker Dr. Mayr bred *Synergus thaumacera*, *Megastigmus dorsalis*, and *Syntomaspis cerri*, from these galls. This last new species of *Torymidæ* has only been bred from this and the *S. politus* gall; fourteen specimens were bred in March of the second year.—E. A. FITCH.

96. *Spathegaster Taschenbergi*, Schl.—The typical galls now before me agree both in form, size and structure with the gall of *Spathegaster flosculi*, Gir. (*Giraudi*, Tschek.), differing only in pubescence. In Schlechtendal's species the surface of the gall (in the dried state) is thickly covered with dark violet hairs, which stand out perpendicularly: they are straight, rather short, stiff and rather pointed at the ends; whilst in the gall of *S. flosculi* these (in the dried state) are yellowish green, reddish, or brownish yellow in colour, more or less curved, tolerably long, soft and shaggy; the galls are

also sometimes rather narrower in form, the stripes or bands appearing thinner (on account of the loss of sap in drying). In a letter to me Herr von Schlechtendal has corrected his former statement that the galls also appear on the young one-year old twigs. Since the galls of *S. Taschenbergi* and *S. flosculi* stand so very near one another, and the imagos of both species only differ in unimportant points, I can come to no other conclusion, from our present knowledge, than that they are both one species.—G. L. MAYR.

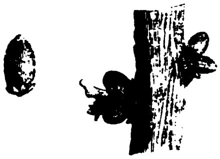
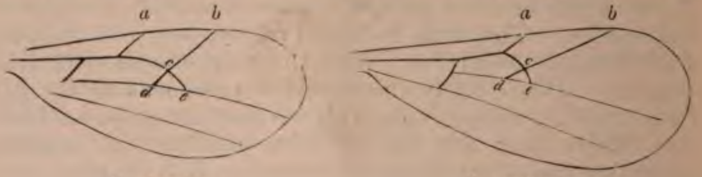


Fig. 96.—Galls of *Spathegaster Taschenbergi;* and magnified.

In May of last year Miss E. A. Ormerod and Mr. G. B. Rothera both sent me galls, which are doubtfully referable to this species. They were collected respectively from Sedbury Park (Gloucestershire) and from the neighbourhood of Nottingham. I have lately also received specimens of the gall from Mr. P. Cameron. As with several bud-galls, so here: it is likely there are two or three closely-allied species, which are not as yet distinctly defined.—E. A. FITCH.

These translations are at last completed. Commenced by Mrs. Hubert Herkomer (*née* Weise), with notes by the late Francis Walker and Edward Newman, and finished by myself, they have run through five volumes of the 'Entomologist.' This length has no doubt made them wearisome to many, but by some I am assured they have been appreciated; and no better starting-point can be taken, for a knowledge of the various galls, than Dr. Mayr's excellent figures and descriptions. The translation has been kept as literal as possible, and in my added notes I have endeavoured to collate what is already put on record respecting the various species. A knowledge of galls has been aimed at by many, but the difficulty of finding a foundation on which to build has deterred many workers. This is shown by the many enquiries that have reached me for books on the subject: of these there are none; gall literature is mostly scattered in various entomological serials. After the works of Malpighi, DeGeer, Réaumur, Linné, Fabricius, &c., the most important memoirs are Hartig's, in Germar's 'Zeitschrift,' ii. 176—209 (1840), iii. 321—358 (1841), iv. 395—422 (1843); Giraud's, in 'Verhandlungen, z.-b. Gesellschaft, Wien.' ix. 337—374 (1859); Schenck's, in 'Beitr. z. Kenntniss. d. nass Cyn.' (1865); and Schlechtendal's, in the 'Stettiner Entomologische Zeitung,' xxxi. 338—347, 376—398 (1870); but very many smaller and scattered papers must be referred to. Those by Osten-Sacken, Walsh, and Bassett, in the first four volumes of the Proceedings of the Entomological Society of Philadelphia, are important. A series of papers on the British species, by the Rev. T. A. Marshall, appeared in Ent. Mo. Mag. (1867—8): in these fourteen oak species are described as British; we now know forty-one to be indigenous. This shows that good work has been done.

A general enquiry has been—how to distinguish the inquiline *Synergi* from the true gall-makers? This may be at first rather confusing; but perhaps the best general guide that can be given is the venation of the fore wings. The two accompanying figures show the difference clearly. The gall-makers have the second cubital areola (*c*, *d*, *e*, in figure) at the base of the radial cell (*a*, *c*, *b*, in figure), whilst the *Synergi* have it near the middle. The first section—Hartig's "area radialis angusta, areola basalis"—is represented by a wing of *Andricus curvator*, Hart., and the inquiline—Hartig's "area radialis brevis, lata; areola intermedia"—by a wing of *Synergus facialis*, Hart.



S. FACIALIS. A. CURVATOR.

a, *b*, *c*. Areola radialis; *c*, *d*, *e*. Areola cubitalis secunda.

It is amongst the Hymenoptera, especially the gall-making species, that some of the most interesting and astonishing problems in insect biology are to be worked out. In gall-makers we have the formation of the gall: the active agent, its development, the life-history of the gall-fly, and the other insect life,—normal, inquiline, or parasitic,—which is also connected with the gall. Of each of these we know comparatively nothing. When the whole life and surroundings of a single gall-fly can be written, it will doubtless be found to bear directly on many disputed or little understood points of entomological knowledge generally. But nothing can be done without breeding; and when the gall species is correctly determined the gall-maker is easily recognised. For some remarks on the breeding of gall-flies, see the 'Entomologist,' viii. 170. The study of the flies themselves is at present difficult and unsatisfactory; the descriptions may be referred to in the papers mentioned above; and there is a synopsis of genera, by Dr. Förster, in the nineteenth volume of the Vienna 'Verhandlungen' (1869).

Two new European oak species have been described since the appearance of Dr. Mayr's work, viz.:—***Andricus Schröckingeri***, Wachtl. (Verh. z.-b. Gesell. Wien. xxvi. 713), which causes a gall on the leaf of ***Quercus cerris*** something like that of ***S. albipes;*** and ***Aphilothrix Kirchsbergi***, Wachtl. (Verh. z.-b. Gesell. Wien. xxvi. 713). This last is the ***Cynips gemmea***, Gir., which was figured in the 'Entomologist,' ix. 78.

The following is a list of our British oak species as far as our present knowledge goes, giving the name of species in the first column, reference to the gall in the second, the time of appearance of the gall in the third, the time of appearance of the gall-fly in the fourth, and the reference to the description and figure in the last:—

				Vol. Page.
Biorhiza aptera, *Fab.*	Root	Spring	November	vii. 3.
„ renum, *Hart.*	Leaf	Autumn	June	ix. 115.
Neuroterus numismatis, *Ol.*	Leaf	Autumn	March	x. 67.
„ lenticularis, *Ol.*	Leaf	Autumn	March	x. 86.
„ fumipennis, *Hart.*	Leaf	Autumn	March	x. 121.
„ læviusculus, *Schenck.*	Leaf	Autumn	March	x. 122.
„ ostreus, *Hart.*	Leaf	Summer	October	x. 161.
Spathegaster baccarum, *L.*	Leaf	Spring	June	x. 206.
„ tricolor, *Hart.*	Leaf	Summer	July	x. 234.
„ albipes, *Schenck.*	Leaf	Spring	May	x. 235.
„ vesicatrix, *Schl.*	Leaf	Spring	June	x. 250.
„ flosculi, *Gir.* „ = Giraudi, *Tschek.* „ Taschenbergi, *Schl.*	Bud	Spring	May	ix. 75. xi. 222.
„ aprilinus, *Gir.*	Bud	Spring	April	ix. 76.
Trigonaspis megaptera, *Pz.*	Bud	Spring	June	vii. 193.
Andricus noduli, *Hart.*	Twig	Summer	September	vii. 99.
[„ testaceipes, *Hart.*	Leaf	(= A. noduli)		ix. 219.]
„ curvator, *Hart.*	Leaf	Spring	June	ix. 195.
„ inflator, *Hart.*	Bud	Spring	June	ix. 50.
„ quadrilineatus, *Hart.*	Catkin	Spring	? February	xi. 133.
„ amenti, *Gir.*	Catkin	Spring	May	xi. 114.

				Vol. Page.
Andricus æstivalis,* *Gir.?*	Catkin	Spring	July	xi. 31.
„ circulans,* *Mayr.*	Bud	Spring	April	ix. 51.
„ glandium,* *Gir.*	Acorn	Autumn		xi. 205.
„ ramuli, *L.*	Catkin	Spring	June	xi. 87.
„ terminalis, *Fab.*	Bud	Spring	June	ix. 28.
Cynips Kollari, *Hart.*	Bud	Summer	August	vii. 241.
Dryophanta scutellaris, *Ol.*	Leaf	Summer	November	ix. 121.
„ longiventris, *Hart.*	Leaf	Summer	October	ix. 146.
„ divisa, *Hart.*	Leaf	Summer	October	ix. 147.
„ agama, *Hart.*	Leaf	Summer	October	ix. 150.
„ disticha, *Hart.*	Leaf	Summer	October	ix. 171.
Aphilothrix corticis, *L.*	Bark	Spring	April	vii. 50.
„ corticalis, *Hart.* „ = Sieboldi, *Hart.*	Bark	Spring	April	vii. 52.
„ radicis, *Fab.*	Root	Spring	April	vii. 2.
„ gemmæ, *L.*	Bud	Summer	? April	viii. 146.
„ glandulæ, *Hart.*	Bud	Autumn		ix. 1.
„ globuli, *Hart.*	Bud	Autumn	February	viii. 254.
„ autumnalis, *Hart.*	Bud	Autumn		viii. 255.
„ collaris, *Hart.*	Bud	Summer		viii. 289.
„ albopunctata, *Schl.*	Bud	Spring	November	xi. 220.
„ callidoma, *Hart.*	Bud	Summer		viii. 290.
„ solitaria, *Fonsc.*	Bud	Summer	September	viii. 169.

Maldon, Essex, September, 1878.

AN INCIDENT IN THE HISTORY OF AMPULEX COMPRESSUM.

By H. S. Schurr

(Of the Bengal Police, Midnapore).

Received by Mr. G. R. James Rothney, Calcutta.

I have to tell of a real "pucka" bug incident that I saw yesterday, and which may interest you, as a similar incident once before interested you and me in the Fulta Road.

Well, yesterday being a holiday, and I having nothing to do and feeling a bit lonely, I went out for a long exploration on my little pony. I was out ever so long, and came back pretty tired and hungry, and found three men in my rooms smoking, and making themselves quite at home, with kegs, &c. Well, this riled me, as they would not go away; and I could'nt ask them to breakfast as I have only two knives, forks, &c. Well, they eventually departed; and then I had got a headache from my ride, and not getting my tub and breakfast at once. So I laid down and tried to sleep, but it was no use: this man came to call, that man to arrange about rackets, and Chuprassie brought letters and papers to sign, another brought recruits for inspection; and I had'nt a moment to myself, and I was properly savage. Looking about my room to vent my rage upon something, I saw a brown something disappear round a corner, and thinking it was a snake I got up to do for him, with a hearty good will. I was surprised to find it was a common cockroach, in tow of one of those green wasps that we saw throwing those ferocious red and black ants off a tree in the Fulta Road. Well, as the cockroach was ever so much bigger and heavier than the wasp, I was a bit surprised to see how easily Mr. Wasp seemed to be hauling him along, and I was curious to find out how and why he did it; so I watched him carefully. He had dragged the cockroach all across my room, over the threshold, and out into the verandah, when he let go of his victim; and, going to a small hole, carefully measured the size every way, then went inside for inspection, and eventually returned to the cockroach, who, strange to say, quietly awaited the return of Mr. Wasp, who now began his preparations for taking the cockroach in tow; and this is how he managed it. He got hold of the cockroach's feelers,—you know the things I mean, like two long hairs sticking out of his nose, or wherever he may be pleased to carry them; then the wasp with his mandibles got hold of one of the feelers, and began to pull the cockroach; but a bit of the feeler broke off; and the cockroach, instead of trying to bolt, stopped still and twitched all over, as much as to say this is more familiar than pleasant. Well, Mr. Wasp got a good grip of the cockroach, and began to pull him into the hole head foremost: the cockroach allowed him to get his head in, and then, evidently finding the quarters unhealthy and a bit cramped, began to back out vigorously. But it was no go; the wasp had him tight, and began pulling with a will. But presently Mr. Wasp found his victim was stuck fast, and he was unable to draw him in; so he immediately set to work to drive out his victim, the victim aiding him in his endeavours with the most hearty co-operation; and very shortly the cockroach was free, and at large. Having backed about two inches from the hole he very foolishly stopped stock still, and gazed at Mr. Wasp busily engaged in enlarging the hole. Having finished the hole, and finding it to his satisfaction, he quietly got hold of the cockroach by his feelers, and again began to drag him in: it was "a long pull and a strong pull," but not quite together; as the cockroach said to himself "This is my last chance, and Providence won't come to help me again." Alas! for him, he was quite right. So he set to work to resist vigorously, and took advantage of every angle in the entrance and every irregularity he could lay hold of. But at last, after nearly five minutes long and steady pulling on the part of Mr. Wasp, he managed to draw him past the sticking point; and then it was all over with the cockroach.

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* Turkey oak species,

[*Ampulex compressum* is a brilliant green insect, with bright red legs, and is one of the *Spheyidæ*. It is well known to provision its nest with cockroaches. It is found in India, China, Borneo, Singapore, Sumatra, Java, Celebes, Madagascar, &c.—Ed.]

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Vanessa Antiopa in Perthshire.—I had the good fortune to capture a specimen of *Vanessa Antiopa* on the west side of Ben Lawers, Perthshire, on August 26th.—A. Craig-Christie; Millnore, Killin, Perthshire, August 29, 1878.

Early Vanessidæ.—Are not the *Vanessidæ* appearing very early this year? On August 9th I took *Cynthia cardui*, *Vanessa Io*, *V. urticæ*, *and V. C-album*, in North Yorkshire, near Pickering; *Argynnis Paphia* were also plentiful, but much worn. Moths were next to entirely absent: I sugared four times, and only saw six *Noctuæ* in all. *Geometridæ* were very scarce, and only the commonest species were represented.—J. C. Wassermann; Cullercoats, September 4, 1878.

Absence of Colias Edusa in 1878.—After the extraordinary abundance of *Colias Edusa* last year we might naturally expect at least an average occurrence of this species this year; but in this neighbourhood I have not seen a single specimen. I feel interested to know if this scarcity is universal in England, or only confined to this district. Perhaps some of your correspondents will favour us with their experience in other parts of the country in reference to the occurrence of *Colias Edusa* this year.—W. McRae; Westbourne House, Bournemouth.

Variety of supposed Satyrus Tithonus.—I am sending to you a sketch of *S. Tithonus*. The specimen appears to me to be a remarkable one in the following particulars: *i. e.*, the ground colour of the upper side of both the fore wings is a pale yellowish brown or buff, relieved by the ordinary orange colouring, which contrasts singularly with the ground colouring; the antennæ and the body of the insect are also buff-coloured; and the specimen, which is in good condition, presents generally a bleached appearance, and more resembles *Chortobius Pamphilus* in general colouring, though not otherwise. The specimen, which is a male, and is rather under the usual size I think, was taken by myself near Tenby, South Wales, in the summer of 1871. In the 'Entomologist' for January, 1878, is figured a bleached variety of *Satyrus Janira*, captured near Dover. I have myself seen bleached specimens of that species, but not of *Tithonus*, and cannot find that it is liable to such variation, or indeed to any variation, except with regard to the size or number of the ocelli.—G. W. OLDFIELD; Weybank House, Guildford, September 4, 1878.

[The sketch sent is of what appears to be a very exceptional variety of *Satyrus Tithonus*, and the foregoing is an accurate description.—ED.]

CHŒROCAMPA ELPENOR.—On September 13th I captured a fine specimen of *Chœrocampa elpenor* in a spider's web. Newman states June as the month of its appearance. Does it often occur so late?—H. M. PARISH; Mount Street, Taunton, September 18, 1878.

CHŒROCAMPA CELERIO AT WOODBRIDGE.—My collection has lately been enriched by a specimen of *Chœrocampa celerio*, captured at Woodbridge, Suffolk, by E. Cobbold, at about the beginning of September. The moth was found settled on a door, at about 7 p.m., and was knocked down with a handkerchief, which was the cause of its wings and body being slightly rubbed; otherwise the moth is in good condition. — H. GRAVES; 15, Lindore Road, Clapham Common.

ORGYIA CŒNOSA AT WICKEN FEN.—Mr. Eedle will be interested to know (Entom. xi. 212) that I took five fine specimens of this species at light, in Wicken Fen, at the end of July last: three of them on the night of the 26th; and two, two or three nights later. Mr. Eedle is very likely correct in supposing that the floods several years ago destroyed most of the larvæ; and should a similar occurrence take place now, perhaps the moth would be all but exterminated. On the other hand, however, it is only reasonable to suppose that a few ordinary seasons may bring the species to us again almost as plentifully as ever; especially as only the males seem to come to light, and the females, which we must suppose are almost as numerous, are rarely seen. I have more fear of the extermination of *Papilio Machaon* at Wicken Fen than of *Orgyia cœnosa;* for although we found the larvæ pretty freely, the systematic way in which they are collected must tell upon them before many years hence.—G. T. PORRITT; Highroyd House, Huddersfield, September 3, 1878.

ACRONYCTA ALNI AT HEREFORD.—I found here, on September 7th, a full-grown larva of *Acronycta alni*, on a stile under a black poplar. Unfortunately it escaped from the box in which it was confined, and was killed by a prowling spider. Is not this unusually late for the larva?—H. N. RIDLEY; Bishopstone Rectory, Hereford, September 10, 1878.

RAPHITES QUINQUESPINOSUS AND ACRONYCTA ALNI.—On August 4th I was fortunate enough to meet with a specimen of the *Raphites quinquespinosus* asleep, in a flower of the black knapweed; and on the 21st ult. I found a full-fed larva of *Acronycta alni* on some palings.—E. N. BLOOMFIELD; Guestling Rectory, September 18, 1878.

LEUCANIA ALBIPUNCTA AT CHICHESTER.—I had the good fortune to take a fine specimen of this insect on August 20th, at sugar, on a willow (*Salix alba*) in front of this house. The instant the light was thrown on the tree it fell to the ground, and was lost; but on my second visit it had returned to the sugar, and I then happily secured it. It seems to me, if I may venture an opinion, that to the characteristics given by Guenée, and quoted by Newman in his 'History of British Moths,' for distinguishing this species from *Leucania lithargyria*, might be added the greater brilliancy and whiteness of the spot, which more resembles that of *L. conigera.* The outer elbowed line, too, which in *L. lithargyria* is broken up into black dots is in *L. albipuncta* distinctly scalloped, or extended into seven very acute angles. I am indebted to the kindness of Mr. Buckler for comparisons with a continental specimen in his cabinet.—J. ANDERSON, jun.

LEUCANIA ALBIPUNCTA IN THE ISLE OF WIGHT.—While collecting in the Isle of Wight during this season I had the good fortune to take eight specimens of *Leucania albipuncta.*—J. VENABLES; Barnes.

LEUCANIA ALBIPUNCTA.—While staying at Folkestone last August I took two specimens of *Leucania albipuncta* at sugar: the first, a female, on the 14th; and the second, a male, on the 25th. Both came to sugar rather late in the evening.—F. HEATHERLEY; 79, Newman Street, W., September 19, 1878.

TAPINOSTOLA HELLMANNI IN MONK'S WOOD.—I took two specimens of *Nonagria Hellmanni* while sugaring in this wood, on Tuesday, August 6th, 1878. I believe this to be an addition to the fauna of Monk's Wood.—H. HEBBLETHWAITE; 15, Grove Terrace, Bradford, Yorkshire, September 9, 1878.

MIANA ARCUOSA AND PLUSIA INTERROGATIONIS NEAR LONDONDERRY.—I have to record the capture of these two species near Londonderry. I believe *M. arcuosa* has not been taken in Ireland before, and only one specimen of *P. interrogationis*. The former was taken by a friend of mine, Mr. J. Milne. I bred three specimens of the latter, and also captured a few. —W. H. CAMPBELL Ballynagard House, Londonderry, August 16, 1878.

HELIOTHIS SCUTOSA IN CO. DONEGAL, IRELAND.—I had the good fortune to capture a specimen of this rare insect in co. Donegal on August 19th. It was slowly flying over the heather on the side of a small hill on the sea-shore, about 3.30 p.m. As I did not know the species I sent it to Mr. Birchall, who kindly named it for me.—W. H. CAMPBELL; Ballynagard House, Londonderry, September 23, 1878.

AGROTIS AGATHINA AND THERA FIRMATA AT SUGAR.—Last Saturday night I took *Agrotis agathina* at sugar for the first time, although I have sugared in the same locality each autumn for some twenty years. We have taken them hitherto at flowers, or on the wing. I have likewise taken a fine series of *Thera firmata* at sugar, this season.—W. PREST; 13, Holgate Road, York, September 18, 1878.

BOLETOBIA FULIGINARIA.—On July 15th I captured a nearly perfect specimen of this rare moth in a garden here. It is a female, and I got a few eggs from it, though these were unfortunately infertile.—C. G. NURSE; Southgate Green, Bury St. Edmunds.

EMMELESIA TÆNIATA LARVA.—Of this hitherto unknown larva I have at last succeeded in rearing some from eggs. It has baffled me for years to find any special plant to feed it upon. The most likely plant was the enchanter's nightshade. Of this I have beaten acres to no purpose; in fact it seemed a hopeless task even to discover whether the larva was green or brown, or what it was like. Now, however, I am able to give its history up to date. During the month of July I spent nine days in the lake district, and paid special attention to getting this species, as usual. The species only comes out of the dark woods when worn. I secured about a dozen females, all of which I kept to lay eggs. About twenty eggs hatched in the second week of August. I put in the glass along with them *Hypericum*, enchanter's nightshade (*Circæa lutetiana*), dead nettle (*Lamium*), groundsel (*Senecio vulgaris*), knot-grass (*Polygonum aviculare*), and many other plants; and last, not least, a leaf or two of the garden nasturtium. Several of them went to work by making a round hole through a leaf of the latter plant,—one appearing to take better to it than the others,—the rest seem inclined to hybernate, while this one is nearly full fed. It is quite seven-eighths of an inch long; and the following is a rough description:—Ground colour of the back and sides a rich dark salmon, tinted brown at each segment; on the back there is a pale pink lozenge-shaped spot, darker at the edges, and in the centre of the spot is a clear black wedge-shaped mark; the colour on the back at the anal extremity becomes much paler for three-eighths of an inch, and there are two rows of spots of a brownish black down to the anal point; the sides and abdomen are of a pale pinkish yellow, with no other markings than two spots at each segment underneath of this shape; legs same colour as abdomen; the head slightly darker, with short scattered hairs. The habit of the larva is much after that of *Emmelesia unifasciata:* when touched it frisks about, as if it wanted to be played with. I have made a rough sketch and coloured it, so that it may be a guide for another day, until more is known of this northern species.—J. B. Hodgkinson; 15, Spring Bank, Preston, September 12, 1878.

Camptogramma fluviata at Southport.—I took this day, on the sandhills between Freshfield and Southport, Lancashire, a perfect female specimen of *Camptogramma fluviata*, which I venture to think worthy of record in the pages of the 'Entomologist.'—Hastings Dent; 112, Bury New Road, Manchester, August 23, 1878.

Micro-lepidoptera Larvæ on Hackney Marshes.—During the past three weeks I have met with the following species:—The blotched appearance of the leaves of sallow betrayed the presence of *Gelechia notatella*, of which I secured about fifty; and on the same bush were a number of the cones of *Gracillaria stigmatella;* but the latter had mostly quitted their feeding places and retired to the under side of the leaves, where their white, silvery-looking cocoons were not so readily seen. *G. Næviferella* occurred in the leaves of *Chenopodium*, but were scarcer than usual. *G. Hermanella* were tolerably common on the same plants in sheltered situations, but their mines are far less distinct than the conspicuous white blotches of the preceding. *Coleophora paripennella:* this appears to be a general feeder, having myself found the cases containing larvæ occasionally on wild apple, elm, hop, sallow, hawthorn, bramble, blackthorn, dewberry, birch, and hazel, but they give a decided preference to the latter; they are comparatively common this year, and I doubt not may be collected for the next two or three weeks. Among thistles in a well sheltered situation I found eight full-fed larvæ of *Coleophora Therinella.*—W. MACHIN; 22, Argyle Road, Carlton Square, E., September 18, 1878.

THE SEAT OF THE SENSE OF SMELL IN INSECTS.—Those who contend that the antennæ of insects are their organs of scent are sometimes told that there is a total lack of direct observations in support of their view. Whilst declining to admit this assertion (see 'Nature,' July 18, 1878, p. 302) I must beg to mention a few observations I have made upon wasps, and which doubtless numbers of entomologists will be able to confirm from their own experience. That wasps have an acute scent, and seek their prey or their food by its means, will be I think generally admitted. When a wasp alights upon a table, a window, or any other surface, and begins running about in quest of booty, its antennæ are kept in constant play, touching the surface on which the insect is travelling in all directions, in a manner which strongly resembles the action of a dog when seeking something by scent. This week I saw a wasp take a dead house-fly and begin devouring it, its antennæ being all the time rapidly and incessantly touching the carcase. Now we can readily understand an animal sniffing at its food; but no one surely ever saw or can conceive of any creature applying its organs of hearing to the object it was devouring. Another wasp having found a dead companion on a shelf began to eat it,—the only instance of cannibalism I have noticed in the species,—using its antennæ in precisely the same manner. When a wasp is flying it keeps its antennæ advanced and extended, so as to be in the most favourable position for receiving the impression from any odoriferous substance. These facts I submit agree perfectly with the hypothesis that the antennæ are the organs of scent. That they may possibly subserve other senses, also, I do not seek to deny.—J. W. SLATER; 3, Bicester Road, Aylesbury.

INSECTIVOROUS PLANTS.—Referring again to the subject of insectivorous plants, introduced in the September number of the 'Entomologist' by Mr. Corbin (Entom. xi. 197), I must say that I think the use of the various epidermal appendages of plants has not yet received sufficient attention, since doubtless through the hairs, glands, &c., plants obtain a large proportion of their food; in fact these appendages may be considered as embryo roots. Take for example a plant growing in rich moist soil, and observe the more generally glabrous character of its foliage; and then observe even the same species in an arid situation, and see the profusion of hairs with which it becomes covered, acting doubtless not only as means to obtain food by absorption of nitrogen from the dew, &c., but also for protecting the plant from too great heat or cold. Besides the plants noticed by Mr. Corbin as insectivorous *Saxifraga tridactylites* may be added, as being able not only to retain, but also to assimilate, insects; and the various Saxifrages,—*Saxifraga geum*, *S. umbrosa*, *S. granulata*, *S. hirsuta*; *Chrysosplenium*; &c.,—all are clothed with hairs extremely sensitive to ammonia, as discovered by Dr. Darwin, and on which insects frequently get caught. The various *Silenæ* are named catchflies, from the same property; but as yet I have not found that assimilation follows the capture of insects by them. This property is possessed also in a large degree by the lovely *Menziesia polifolia*, the viscously hairy peduncles always having some Diptera attached. I have noticed also insects dead or dying on *Diotis maritima*, in Jersey; on *Picris hieracioïdes*; on *Silene conica*, *S. quinquevulnera*, *S. anglica*, *S. noctiflora*, and *S. nutans*; and on *Cerastium tetrandrum*: the latter had several small beetles adhering to it, *Epilobium parviflorum*. On the connate leaves of *Dipsacus* plenty of insect *débris* is always to be found; and Mr. Francis Darwin has recently made a most interesting discovery of the means by which nutriment is obtained from the liquid contained in these connate receptacles. *Senecio viscosus* and *S. sylvaticus*, *Sonchus arvensis*, *Hyoscyamus niger*, and various *Orobanchaceæ*, also have been noticed with adhering insects. It is worth remembering that plants entirely destitute of hairs, notably our indigenous *Orchidaceæ* and *Siliaceæ*, generally have excessive root development, as bulbs, tubers, &c.; and also that the *Orobanchaceæ*, often parasitic upon plants totally insufficient to yield the nourishment for such large plants, are covered with long glandular hairs, through which a very considerable portion of nutrition must be obtained; and like the *Drosera*, *Pinguicula*, *Corallorhiza*, *Neottia* *nidus-avis*, &c., are almost destitute of chlorophyll, although it exists in a passive condition in many of these plants. Attention to this interesting subject must yield many important discoveries; and to none could the study be more suitable than the readers of the 'Entomologist.'—G. C. DRUCE; Northampton Natural History Society.

ADDITIONS TO THE DOUBLEDAY COLLECTION.—The notice in the exchange list of the September number of the 'Entomologist,' that fresh specimens of no less than 238 species of Lepidoptera are required for the "Doubleday Collection" at the Bethnal Green Museum, must surely be a matter of surprise and regret for the majority of entomologists. In this regret I fully share, but I must confess that I am not surprised. Soon after the Collection was received at Bethnal Green, and before the public were admitted to see it, I went through it, and called the attention of the authorities of the Science and Art Department, at South Kensington, to the fact that many specimens were in imminent danger of destruction by mites, and offered, as a labour of love, to endeavour to check this threatened destruction. In consequence of my letter I was asked to meet Mr. Matchwick (under whose control, I believe, are the natural-history collections) and the late Mr. Andrew Murray. It was then decided that, previous to moving infected specimens, a catalogue should be made, and that then the mites should be attacked. The making of this catalogue I superintended, and I understood Mr. Murray would then eradicate the mites. Immediately after the demise of Mr. Murray I heard that the destruction of the specimens was progressing, and I again wrote to the authorities at South Kensington Museum offering my services. My letter was acknowledged, and an answer promised,—which, by the bye, I have never received. The mites in the interval have, I presume, had it all their own way, otherwise a request would not now be made for 238 species. I am afraid that the want of care,—I can call it nothing else,—which has permitted this loss of Lepidoptera, will not encourage entomologists to come forward to jeopardise further specimens; besides the Collection will be the "Doubleday" Collection but in name, if it is to be formed of specimens with which Mr. Doubleday had nothing to do. The proposal revives the story of Jack's knife; and of the celebrated old musket, of which nothing remained but the touch-hole. I notice the appeal is made "out of respect for the memory of the Founder." Out of such respect I made my offer of free service. Surely respect would have been better shown by preventing the loss of the specimens.—A. B. Farn; Dartford, September 9, 1878.

[In justice to Mr. Murray it may not be out of place to mention that the immediate cause of his last and fatal illness was the amount of chloroform inhaled by him when working for the preservation of the Doubleday Collection. At first he used the chloroform every day; then he attended once a week; but succumbed altogether at last. Whether the remedy was a wise one is not now under discussion.—E. A. F.]

The Doubleday Collection.—The announcement in the exchange list of the September number of the 'Entomologist,' that this collection is to be put "in proper order," by adding "fresh specimens," &c., will I am sure be received with painful surprise by many of the lepidopterists of this country. The great interest which centres in the Collection at Bethnal Green arises solely from the fact that it is *the Collection* formed by the late Henry Doubleday, and, as such, is looked upon by the present generation of lepidopterists with a feeling almost akin to reverence. Once begin adding to, or taking from it, and this interest ceases for ever; and the Collection at once descends to the level of that of any ordinary museum. With proper care it will keep, *as it is*, for many years to come. I grant, of course, that the contemplated "improvements" would make it more valuable in an educational point of view. If the museum authorities want a collection for this purpose (and every museum ought to have one), let them get a new cabinet and start a fresh collection; when I venture to say our lepidopterists will send their duplicates to it with far greater alacrity than they will in the former case.—G. T. Porritt; Highroyd House, Huddersfield, September 3, 1878.

Tapinostola Bondii.—I observe in the exchange list of the 'Entomologist' for September the above species offered, and marked *bred*. This must surely be an error, otherwise someone is, I fear, losing the great credit due to so important a discovery. Also in some of the exchange notices would it not be better to distinctly notice which were British insects, and which continental types.—W. Purdey; 132, Dover Road, Folkestone, September, 1878.

[This was a compositor's error, owing to bad copy: the word "bred" applied to preceding species, *Cynipiformis*, as printed in August number. Continental specimens should always be so designated; but see notice at head of exchange list.—Ed.]

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IDENTITY OF EPHIPPIPHORA OBSCURANA (*Steph.*) AND E. GALLICOLANA (*Zell.*).

By Walter P. Weston.

Wilkinson, in his work on the British Tortrices, describes this species as *Semasia obscurana*, which description Mr. C. G. Barrett, in his excellent "Notes on Tortrices" (E. M. M., vol. x. p. 144), considers more applicable to *Gallicolana*, Zell., and he then gives his reason for his opinion, and the chief points in which that species differs from *Obscurana*, which are "the greater breadth of the fore wings, the more upright, clearer, and whiter dorsal blotch, and the more richly coloured apical space." Mr. Barrett then gives Stephens' description of *S. obscurana*, Steph. I have always been disposed to consider these two insects as one and the same species, thinking *Obscurana* to be only smaller and worn examples of its congeners, to which it is most closely allied; but it was only this season that I bred sufficient numbers to satisfy myself as to their identity. For the last four or five years I have captured a few specimens of *Obscurana*, Steph., every year, and amongst them one which closely answered the description of *Gallicolana*, Zell. Mr. Barrett, however, to whom I sent it, returned it to me as a variety of *Obscurana*, but closely approaching *Gallicolana*, having the costal spot white and very decided, but the fore wings were hardly broad enough.

Last season I collected several oak galls (chiefly those of *Cynips terminalis*), from the very trees round which I had been accustomed to take *E. obscurana*, and succeeded in rearing four undoubted specimens of *E. gallicolana*, all of them being larger than *Obscurana*, the ground colour of the fore wings darker, and the costal blotch very clear and decided, but as variable in shape as it is often found in different examples of *E. cirsiana*. These specimens, which consisted of one male and three females, were all 8 to 8½ lines in expanse.

Following up my success I bred this year, from galls from the same locality, seventeen or eighteen specimens, varying greatly in size, intensity of colouring, and in the shape and size of the costal blotch. Of these the largest was close on nine lines across, and the smallest under six lines. In some the costal blotch was clear and white, in others it was traversed by two distinct brownish lines, darkest on the costa and sloping towards the apex of the fore wings, and in the remaining examples the blotch was more or less suffused with a brownish tinge.

I was only able to capture two examples this year, but my friend Mr. Howard Vaughan, who was more fortunate, kindly lent me his series for comparison. Nearly all the captured specimens are considerably lighter than the bred ones, and the costal blotch, instead of being white, is of a light brownish grey tinge, in which the darker traversing lines mentioned by Wilkinson are very distinct. Noticing that the more worn a specimen was, the darker the costal blotch became, and the nearer it assimilated to the ground colour of the fore wings, and thinking the white blotch might be formed by an outer layer of scales which would soon wear off with the flight of the insect, I allowed a bred specimen, with a very distinct white blotch, to remain in the breeding cage. It fully answered my expectations, on the second day of its existence the blotch being of a light brown colour, and the velvety appearance of the fore wings having entirely disappeared. Altogether it presented a most distinct appearance, so far as colour was concerned, from its bred companions. In none of my specimens have I been able to find the "lustrous blue markings towards the apex of the front wings," as mentioned by Wilkinson. According to the custom of priority of nomenclature, Professor Zeller's name, *E. gallicolana*, should be adopted for this species.

Ephippiphora gallicolana must be considered as a local rather than a rare insect. It is to be found at Tilgate Forest, and, nearer London, at Epping and Darenth Wood. I have also taken it at West Wickham and Highgate Woods; but my first specimens came from a small oak copse close to the Alexandra Palace, and I am sorry to say since destroyed. It flies at dusk round the boughs of the oaks, and always high; its flight is slow and steady, which enables it to be at once distinguished from *Phoxopteryx Mitterbacheriana*, which is usually out in abundance at the same time. The time of appearance of the moth is somewhat irregular, occurring from the middle of May to the middle of June, but the latter end of May is the best time to look for it. *E. gallicolana* may be reared from the galls of *Cynips terminalis*, which are to be found in plenty in the autumn, and it prefers those of the preceeding year's growth. When the imago emerges the pupa case is left sticking half-way out of the gall, and in some cases the moth emerges by the hole eaten by the *Cynips*, but in others makes one for itself, and in this case a small beautifully round cap of the outer surface of the gall is pushed out and left at the side of the pupa case.

I have bred this Tortrix from some galls from which the *Cynips* has never emerged, and which had no apparent hole in them, clearly showing that the larva must have lived in them, and could not have gone into them to pupate as *Heusimene fimbriana* undoubtedly does. I have never found more than one moth emerge from each gall, and the proportion of galls containing this insect is two or three per thousand.

This insect seems somewhat out of place in our lists, being far more closely allied to *Coccyx argyrana* than to *Ephippiphora populana*. As in *C. argyrana*, the posterior wings of the males have a wide pale patch in the centre, surrounded by a darker outer margin. Indeed in shape and markings it very closely resembles that species, being distinguished from it by the uniform dark brown ground colour of its fore wings, and by its later appearance in the imago state. From the same lot of galls I reared four *C. argyrana*, a few *C. splendidulana* and *Heusimene fimbriana*, besides two specimens of both *Catoptria Juliana*, and *Eupœcilia maculosana*, the latter not being usually considered an inhabitant of galls in any stage of its existence.

1, Duncan Terrace, N., October, 1878.

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. Kirby,
Assistant-Naturalist in Museum of Science and Art, Dublin.

No. X. NYMPHALIDÆ—NYMPHALINÆ.

(Genera allied to VANESSA, continued.)

AMONG the commonest and most widely distributed of the exotic butterflies are those belonging to the genus *Junonia*. As now restricted, it includes several species with smooth eyes (those of the *Vanessæ* are hairy), and with fore wings but slightly emarginate, and hind wings rounded and slightly dentated. They are insects rather larger than *Vanessa Urticæ*, of a black, brown, or occasionally greyish colour, generally adorned with two eyes on the hind wings and one towards the hinder angle of the fore wings. Several species are common in every collection from the East Indies, such as *J. Lemonias*—brown, the eyes with blue pupils, and standing in reddish orange rings; the fore wings are spotted with buff. *J. Laomedia* is of a slightly iridescent grey, with transverse zigzag brownish lines, and a row of rather small eyes beyond the middle, of which two towards the tip and one towards the anal angle of each wing are more distinct than the others, and consist of an outer brown ring, an inner grey or buff one, and a black pupil surmounted with orange. Another East Indian species is *J. Orithya*, a rather smaller insect; the fore wings black, with buff apical markings, and the hind wings broadly blue towards the hind margin. The eyes consist of two black rings, separated by a red one, and the inner one nearly filled by a lilac spot. The African *J. Clelia* resembles this, but is larger; the hind wings are black, with a very large round blue spot at the base. The same character is repeated in the African and Asiatic *J. Œnone*, but the centre of the fore wings and the marginal half of the hind wings are filled up with pale orange, and the eyes are very small and inconspicuous. *J. Asterie* and *J. Almana* are both fulvous, with two eyes on each wing, that nearest the tip of the hind wings being very large, purplish, marked with a large black spot, surmounted by two small white ones, and enclosed in a buff ring partly surrounded with black. *J. Almana* is more angulated than *Asterie;* the hind wings are produced into a lobe at the anal angle, and the eyes of the under side are very indistinct. The Australian *J. Vellida* is brown, with the eyes very broadly surrounded with fulvous, and the fore wings with two fulvous markings in the cell and buff markings towards the tip. The South American *J. Lavinia* closely resembles this, but is very variable, and many of its varieties have received different names. *J. Cœnia*, from the Southern States, is of a light brown, with the eyes surrounded with buff, and the first eye of the hind wings as large as in *Asterie* and *Almana*.

Precis, the largest genus of the present group, is African, though a few are East Indian. The wings are generally dentated; the fore wings generally more or less angulated, and occasionally almost hooked, and the hind wings often produced at the anal angle. We rarely meet with large eyes, as in *Junonia*, though sometimes with a row of small ones towards the hind margins of the hind wings. The beautiful blue *P. Rhadama* of Madagascar, however, has eyes placed as in *Junonia*. The species of *Precis* are generally brown, sometimes almost without paler markings, but they are generally banded with some shade of fulvous, and occasionally marked with blue or red. The species are too numerous to describe in detail. The beautiful brown and fulvous *Thaleropis Ionia*, from Asia Minor, is allied to this genus.

Rhinopalpa is a Malayan genus, including a few large species, three or four inches across the wings. The fore wings are angulated and almost hooked, and the hind wings are nearly square, with a strong projection in the middle. *R. Polinice* is fulvous, with black borders, and *R. Sabina* dark brown, with a broad tawny band across both wings, and a large spot near the tip of the fore wings.

The African genus *Salamis* resembles this in size and shape. *S. Anacardii*, a remarkable iridescent butterfly, is at once the commonest and the best known species of the genus. *Napeocles Jucunda*, the only South American species allied to *Junonia*, is a large black insect, with hooked fore wings and rounded hind wings, a broad blue band across the centre of all the wings, and a blue spot near the tip.

NOTES ON ACIDALIA CONTIGUARIA.

By S. J. Capper.

I SPENT the month of July, 1874, at Llanfairfechan, North Wales, devoting every spare hour to the collecting of Lepidoptera, in which pursuit I was assisted by two or three of my sons and my late friend Mr. Alfred Owen. On returning from Penmaenmawr one evening we were pleasantly surprised on opening our pill-boxes to find a specimen of *Acidalia contiguaria*. This species had then become, as we believed, almost extinct. Mr. Greening, of Warrington, who had been in the habit of breeding the insect, had lost all his larvæ. The source of Mr. Greening's specimens was, I believe, one fertile female, captured near Bangor. At the time of which I now write we were about to leave Llanfairfechan in a few days, so we devoted our time to the most diligent search, and were fortunate in obtaining a few more specimens.

The following July I spent with my family at Penmaenmawr, when, pursuing our search for *A. contiguaria*, we took a few dozen specimens, and I sent eggs to friends; but none were successful in rearing the larvæ.

Last summer (1877) we spent at Llandudno, and nearly every day visited the locality for this moth, and were again successful. I gave Mr. Sidebotham, who was staying at Llandudno, several living specimens, and both he and myself were this time fortunate in rearing the insect.

This July we again spent at Llanfairfechan, but for some reason or other the insect was not so abundant as in former years, and with the greatest diligence we could only take very few specimens.

The distribution of this moth, I believe, extends all over the heath-clothed mountains of North Wales, for we have taken occasional specimens from Conway to Aber, and I know a few specimens have been taken at Bethis-e-Coed. Excepting a few specimens taken on the wing, quite at dusk, all our captures were sitting on the rocks. We have spent evening after evening trying to take the moth on the wing, as it seems natural to expect the flight at dusk, but hitherto we have met with very little success; and I am inclined to think they are at no time very active.

In captivity the moth is double-brooded, the first brood appearing in July, and the second towards the end of September or early in October. The larvæ feed on heath, knot-grass, and chickweed.

Huyton Park, Liverpool, October, 1878.

NEW BRITISH CRABRO.

By Edward Capron, M.D.

During the past summer I took a fine male *Crabro*, belonging to the group with *scutellate* anterior tibiæ, which I could not refer to any described British species. I have lately shown it to Mr. Frederick Smith, who, on referring to the continental specimens of the Museum, found it to agree entirely with *Crabro pterotus*, Panzer, a species which inhabits France, Germany, Austria, and Sweden. As this is the first recorded instance of its capture in England I subjoin a short description of it:—

CRABRO PTEROTUS, *Panzer* (mas).

Length 4½ lines. Exp. alar. 6 lines. Head black, closely and moderately finely punctured; stemmata in a curve; clypeus and inner orbits with silvery pubescence; mandibles ferruginous in middle. Antennæ with flagellum broadly filiform, flattish; first seven joints ferruginous beneath, last four and scape entirely black. Thorax slightly pubescent, diffusely and strongly punctured. Anteriorly a slight depression, in the centre of which is an elevated line, and two shorter ones laterally. Metathorax very coarsely rugose; scutellum smooth, with a few fine punctures. Femora black, middle pair with a broad yellow streak above; lower margin quite smooth, not denticulate, as in *C. patellatus*. Tibiæ yellow, anterior pair dilated into a convesco-concave plate, which is black, and streaked with well-marked whitish radiating lines. Posterior pairs with a slight ferruginous stain in the middle above. Tarsi yellow, with last joint fuscous. Anterior pair dilated, and last joint produced into a triangular plate, having two short acute spines, one pointing forwards and the other backwards. Abdomen elongate-ovate, black; second segment with a roundish yellow macula, having sometimes a black centre, and forming a nearly perfect circle on each side, and a semilunate yellow patch laterally and towards the apex of the third segment. Hab. Shere, Surrey, July, 1878.

Shere, near Guildford, October 15, 1878.

LIFE-HISTORIES OF SAWFLIES.

Translated from the Dutch of Dr. S. C. SNELLEN VAN VOLLENHOVEN,

By J. W. MAY.

(Continued from vol. x., p. 279.)

CRYPTOCAMPUS ANGUSTUS, *Hart.*

(*Hartig*, *Blatt und Holzwespen*, p. 222, No. 1.)

Cryptocampus niger, in latere nitidissimus, antennis in mare elongatis brunneis, supra fuscis, in femina brevioribus totis nigris, alarum stigmate bicolore, pedibus dilute fulvis, coxis, femorum basi et tarsorum ultimis articulis nigris.

As an appendix to the description of the previous species,* which lives in excrescences on the leaves, I add the histories—very imperfect, it is true—of two species of sawflies, the larvæ of which live in the interior of the branches of the willow. I must premise that I am unacquainted with the larvæ themselves, and I begin to fear it may be years before I have an opportunity of seeing them, even if I ever do so; it seems to me that for their better recognition it may be as well to publish the description of this species after that of the sawfly inhabiting the leaf. I was the more unwilling to keep back the description of *Lugdunensis* until I had met with these *larvæ*, as it is uncertain whether the latter of the two pith-dwellers occurs in the Netherlands, a fact which does not appear from the description by De Geer. By the kindness of Mr. C. Ritsema I received two individuals of *Cryptocampus angustus*, a dead male, and a living female, with the twigs in which were the cocoons, and in which the insects had undergone their metamorphosis. The twigs consisted of the top ends of the common willow (*Salix cinerea*); they had been cut off in the neighbourhood of Oegstgeest, and because there was a hole in one of them they had been opened, one being found to contain a part of a cocoon. At the time they were cut off it was rather cold—it was in the month of March—and there was, consequently, no immediate prospect of the insects inhabiting them making their appearance.

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* *Nematus Lugdunensis*, Voll.

The cocoon found in the hollowed-out pith of one of the branches was cylindrical, with rounded ends, its substance being thin but tough; the colour was pale purplish brown. I am unable to determine whether the larvæ had fed on the pith of these willow-twigs during their whole lives, or whether they had hollowed out the pith merely for the purpose of spinning up. According to what Dr. Hartig states, it might be assumed that the larva had inhabited the interior in the earlier stages of its existence instead of first feeding upon the leaf. This point, must thus be left for determination by future entomologists. The following is a description of the two sexes:—

Male.—Length, five millimetres. Shining black, glabrous. Head but slightly prominent, broad, with two grooves anteriorly along the eyes, hollowed out posteriorly; eyes projecting, these latter black and shining. Trophi brownish; the margin of the labrum hairy; mandibles black at the tips, palpi fuscous. Antennæ two-thirds the length of the body and moderately thick; the first two joints black, the remaining joints dark brown on the upper side, pale brown on the under side; on the last joint (the ninth), there is a small bent up knob, as if there were a tenth joint. Thorax but little wider than the head, entirely black, even the apices of the prothorax being of that tint; the sides very shining. Wings strongly iridescent, nervures brown, costa fuscous; stigma whitish in front, dark grey behind. Abdomen narrower than the thorax, elongate, entirely black, with the exception of a tinge of pitch-brown on the anal valve. Legs black from the insertion of the coxæ to two-thirds of the length of the femora, the remainder reddish yellow, excepting the last joint of the intermediate and posterior tarsi, which are dull black.

Female.—Four to five millimetres. Resembling the male, with the following exceptions:—Head somewhat more projecting; antennæ not longer than half the body, entirely black and thinner; ninth joint shorter than the eighth, and wanting the bent knob at the end. Abdomen broader in the middle than the thorax; the valves of the saw project very far, and are covered with hairs; above them are two abdominal processes. The saw is of a very pale brownish yellow.

As regards coloration, this insect entirely agrees with *Pristiphora testaceicornis* of St. Fargeau, as described by that author and Stephens, but it is entirely different as regards the neuration of the wings, as in the species described by the writers above mentioned the first submarginal cell is stated to be very large, and to receive the two recurrent nervures which in the present species are received by the second submarginal.

CRYPTOCAMPUS MUCRONATUS, *Klug.*

(*Hartig, Blatt und Holzwespen*, p. 223, No. 2.)

Cryptocampus niger, in dorso thoracis subpubescens, antennis in mare brevibus, crassis, brunneis, in femina brevioribus nigris, alarum stigmate in femina tantum bicolore, pedibus e brunneo luteis, coxis fere totis nigris.

I am not sure whether this species is indigenous, but as it occurs in the countries both to the east and west of us, in Germany and England, it may be considered probable that it is to be met with here. I add the description to that of the preceding species on account of the great similarity of the two.

Mucronatus lives in the sickly swollen twigs of a species of willow (*Salix*); I received the galls, if I may so call them, from my friend, Professor Westwood, at Oxford, but without any notes, except that the twigs were from the willow; I received at the same time a quill containing some imagos, both male and female, produced from the galls.

I conclude that this is the species described by De Geer in his 'Memoirs' (German translation, vol. ii. p. 271 *et seq.*, pl. 39, f. 1—11), and by Dahlbom in his 'Clavis novi Hymenopterorum Syst.' (p. 28, No. 38), and called by the latter *Nematus Pentandræ*, mihi, with a reference to Linnæus' 'Fauna Suec.' (ed. 1, num. 943.) According to both these writers more than one larva is contained in these galls, that is to say, two, three, or four, or even five living together; they remain in this state until the end of April, when they change to pupæ, still within the gall. The larvæ are greyish, and toward the end of that stage they acquire a purplish tinge. The cocoons are thin, and of a coffee-brown colour. The pupæ are greyish white with a purple tinge; those of the male are smaller than the pupæ of the female; the eyes, though probably only towards the end of the pupa state, are dark red. The imagos, it seems, appear in the middle of May; they gnaw a circular hole in the gall, through which they make their escape.

The following is the description of the imagos which were sent to me:—

Male.—Length, 5·5 millim. Shining black, with an extremely short and fine whitish pubescence on the head and thorax. Head somewhat more protruding than in the former species, and destitute of grooves. Trophi and cheeks very pale brown, except the tips of the mandibles, which are shining black; palpi pale brown. Upper lip pubescent. Antennæ not more than half the length of the body, thick; the joints sharply divided from each other and thickened below; the first two joints black, the others brown, darker towards the base on the upper side. Thorax narrower than the head, very shining on the sides, with brown tegulæ. Wings iridescent, nervures black; stigma black, with the exception of a brown spot at the base. Abdomen narrower than the thorax, shining black, with the exception of the anal valve, which is of a brown tint. Coxæ black nearly to the tip, apophyses pale brown; femora blackish at the base and thence brown, of which colour are the tibiæ and tarsi, except the posterior tarsi, which are blackish.

Female.—Somewhat smaller. Exactly similar to the male, with the following exceptions:—The antennæ are shorter, and entirely black as far as the last joint, which is brown. The abdomen somewhat thicker, the valves of the saw black and hairy, the anal processes projecting considerably. From half-way the femora the legs are entirely red-brown and shining, with the exception of a longitudinal black line on the under side of the femora. The wings have the stigma white at the base.

NOTES ON COLLECTING IN GLEN TILT.

By F. Buchanan White, M.D., F.L.S.

It is a very long time since Mr. Douglas, climbing up Ben Ghlo, found the first British specimen of *Pachnobia alpina* sitting on a rock, and contemplating (let us suppose) the beauties of Glen Tilt. After having yielded *Pachnobia*, no more is heard, entomologically, of Glen Tilt for many years, when the announcement is made that *Crambus myellus* has been captured there. Again the glen rested for a few years till a favoured few had opportunities of exploring its inmost recesses, and bringing to light its hidden treasures.

Those collectors who have been "privileged" to visit the happy hunting-grounds of Rannoch must not think that Glen Tilt is at all similar in its physical features. In the one case you have a large lake surrounded by extensive woods of birch or fir, giving way in many directions to natural meadows or heather-clad moors, and backed by mountains of various altitudes and at various distances. In the other, at least in so far as the part of it I am about to describe is concerned, you have a long and very narrow valley, through which darts a rapid mountain stream, from whose banks the hills rise, almost directly, in steep green slopes, topped here and there by rugged rocks or banks of loose stones. Trees there are almost none, except a few alders and birches beside the river, or in some of the almost inaccessible ravines, down which the tributary streams pour their waters into the Tilt. Lower down the glen trees become more numerous, and at Blairathole form large and varied woods, but in the part of the glen where most of our collecting has been done trees are few and far between. Through the glen goes a rough road, connecting Blairathole and Braemar, and which is only a bridle-path for many miles. (I ought to mention that though this road can be used by the public, there is no liberty to go off it, and that all the district is strictly "preserved" and well guarded).

With these preliminary remarks I will now invite my readers to accompany me on a short excursion, promising not to take them more than a half a mile or so from the house where our head-quarters are. Within the grounds are three or four trees, and off one of them we begin the day well by taking *Anticlea sinuata*. This is rather a surprising capture in an alpine glen, but is not unparalleled, for on a stone close at hand we find *Melanippe galiata*, *Larentia cæsiata* and *Emmelesia ericetata* sitting side by side, and, on a rock about a stone throw off, *Larentia ruficinctata*. Take a look at that bed of yellow saxifrage, *Saxifraga aizoides*, and after boxing a few *Zelleria saxifragæ* we will begin to ascend the hill. Here we see abundance of the pretty flowers of the rock rose, and flitting about them *Lycæna Artaxerxes* gives many an opportunity of using our nets. Mounting a little higher, we carefully scan the large stones that dot the slope, and are soon rewarded by finding *Dasydia obfuscata* and *Plusia interrogationis*. A dark moth rises, and after a short chase is secured, and turns out to be a very fine *Stilbia anomala*. Coming to a ravine, we very quietly and cautiously inspect an overhanging rock, and find *Eupithecia constrictata* and *E. pulchellata*, sitting amidst a host of *Larentia cæsiata*, &c. A particular rock of this character (*i. e.* overhanging a mountain stream) is known to us as the "*sinuata* rock," because it has more than once yielded *Anticlea sinuata*. Further up the stream we notice a number of moths flying gently about and settling on the grass stems. These we soon discover to be *Ablabia argentana*, a moth which at first we thought was confined to one place in the glen, but which we now know is distributed over several miles. Along with it, if we are lucky, we may get *Scopula decrepitalis*, but it is rather late in the season for that species. (By the way, I would take this opportunity of asking any one who knows the habits of this species to kindly give me some information about it. I have only met with it twice, once in Inverness-shire, and once in Glen Tilt, and in both times it was in a ravine. What I wish to know is, at what time of the year is it most abundant, and what is its hour of flight?)

Pursuing our way up the stream, we come to some grassy slopes, over which *Erebia Epiphron* is flitting about; as usual, in more or less damaged condition. We have now to cross a slope of loose stones, and had better keep a sharp look-out for *Crambus ericellus*, which, in Glen Tilt at least, frequents such places, and has the provoking habit of diving into the crannies where it is impossible to get at it. On these stones, too, we take *Scoparia muralis* and *S. atomalis*, which latter is, I think, nothing more than an upland form of *ambigualis*. We have now attained a height of 800 or 900 feet above our starting-point, which was 1000 feet above sea-level, and have passed the steepest part of the slope. The vegetation here begins to change its character, large beds of *Vaccinium*, of several kinds, replacing the rock-rose and other plants which adorned the lower part of the hill. The slope also is not at so great an angle. We now begin to meet with some of the more alpine insects, though some of those we have already noticed still maintain their ground. *Larentia salicata*, though not confined to this altitude, is certainly more common, and as the afternoon advances begins to fly freely. We also find that variety of *Chelonia plantaginis*, which has the usual yellow markings replaced by white, but it too can be found lower down. A curious form of *Coremia ferrugata*, which puzzled us for a long time, occurs up here as well as lower down, as does *Coremia munitata*. The latter may, however, be taken more freely flying at dusk. Amongst the bilberry we will find *Penthina Staintoniana*, which requires the sun to be shining to tempt it out. This species was at first supposed to be attached to the bear-berry, *Arctostaphylos uva-ursi*, with which plant it has no connection. In damp grassy places *Scopula uliginosalis* affords some employment for our nets; and so we go on, picking up various species, till we reach the ridge of the hill. Here only a very stunted vegetation grows, composed of heather, grass, the mountain azalea, &c., leaving many dry, bare, stony places. Advance cautiously to such a place, holding the net in readiness. See, a black shadow rises from a small stone and flits away. Get the net over it, and behold! you have taken one of the most alpine of our native insects, *Psodos coracina*. There is still another, even more alpine species, and if we are lucky we may meet with it, but we must go higher first. Passing over some peaty ground, we search among the cloudberry, *Rubus chamæmorus*, a very humble relation of the familiar lowland raspberry and blackberry, and catch sight of a little moth somewhat like an *Argyresthia*. Carefully searching, we fail to net any specimens, and what the beast was remains a mystery to this day. Our private idea is that it is an unknown new British species, and if we are not so fortunate as to solve the enigma, let us hope that some one else will. *Apropos* of the cloudberry, we have found the leaves mined by a *Nepticula* which we suspect is the North European species, *tristis*.

We now come to a higher plateau, similar to the one we have just left, and commence to search for *Pachnobia*. Carefully inspecting stones is rather slow work when not rewarded by finding anything, and the stones are legion (even when the amusement is varied by getting an occasional *Psodos* who comes to see what is going on), so we try tearing up and examining the moss. This is a little more lively, as an empty chrysalis-case (not to mention numbers of a bug new to science, *Orthezia Signoreti*) rewards our efforts, but after a while we tire of that too. A herd of red-deer galloping past attracts our attention, and then, "Hi! mark that thick body," and in half a minute more the net is over *Pachnobia* as he flies past. After a more or less (probably very much less) successful search for more, we turn our faces homewards, and finish up the day by sugaring the palings and stones near the house, where, if fortunate, we may get *Crymodes exulis*, and then go to our well-earned beds and dream of all the new things we *may* get next day.

In this slight sketch of the Lepidoptera of Glen Tilt, I have merely mentioned the chief species that have been taken within half a mile or so (as measured on the Ordnance map*) of our head-quarters, and do not mean to say that we took them all on one day, though I believe that that would be quite possible. On another occasion I may describe a day's collecting in another part of the glen.

Perth, October, 1878.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

ABSENCE OF COLIAS EDUSA.—As for the "absence of *Colias Edusa* in 1878" I can answer for its scarcity in Swanage (Dorset), Weston-super-Mare (Somerset), Sheerness (Kent); and, while in other years I have caught them in some of the woods round Highgate, I have not seen one this year.—M. B. H. LANE; 70, Junction Road, Highgate.

ABSENCE OF COLIAS EDUSA.—In reply to Mr. McRae, I have not seen a single specimen of *Colias Edusa* this year near Taunton, Somerset, where last year I saw it in great profusion. I may also add that in Switzerland I only saw two specimens, where I captured *C. Hyale* in great profusion.—R. ADAIR; St. Leonards.

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* That is, on the level. The difference in altitude between our starting-point and the *Pachnobia* plateau is very nearly 2000 feet, so the intelligent reader can calculate what the working distance is. I make it about an hour and a half's steady walking up a very steep hill.

SCARCITY OF COLIAS EDUSA.—I captured one specimen of *C. Edusa* at Exmouth at the beginning of August, but in this locality, though very common last year, I have not seen a single specimen, so that my opinion coincides with that of your correspondent.—E. C. DOBREE FOX; Castle Morton.

DISTRIBUTION OF APATURA IRIS.—With respect to the distribution of Rhopalocera, and the eastward thinning of *Apatura Iris*, lately in question, I can affirm that this species was formerly abundant in pheasant copses at Botley, Hampshire. It was also taken at Fareham.—A. H. SWINTON; Binfield House, Waterden Road, Guildford, October 11, 1878.

HYBERNATION OF SATYRUS ÆGERIA IN THE PUPA.—I should be glad to know if it is unusual for *S. Ægeria* to hybernate in the pupa. I have a few larvæ which have been kept as naturally as possible on couch grass, one of which turned to a pupa on the 10th, and the others are nearly full fed.—R. M. SOTHEBY, Sunny Side, Hastings, Oct. 15, 1878.

VARIETY OF VANESSA IO.—I have to record a variety of *Vanessa Io.* I took the larvæ on July 10th, at Grange, and bred two specimens of the variety; it is entirely without the red-brown scales on the fore and hind wings, which gives it a curious semi-transparent tint.—HENRY MARSH; Wellington Street, Leeds, August 26, 1878.

EXTENDED NOTES ON BREEDING DEIOPEIA PULCHELLA.—From the insects mentioned (Entom. xi. 186) I obtained one hundred eggs, only one-third of which hatched; the few I retained were treated in the same manner as the previous brood; they fed exclusively on *Myosotis palustris*, and did extremely well, for by August 20th (twenty-five days from egg) the first larva spun up; three more had done so by August 25th (my other larvæ in different stages were sent to various friends). These four pupæ produced moths on September 10th, 12th, and 16th, two being males and two females. After being together four days, copulation took place, lasting fourteen hours; the female deposited a few eggs each night for a fortnight, and then died. All these eggs were barren. —W. H. TUGWELL; 3, Lewisham Road, Greenwich, October 15, 1878.

PARASITES OF DICRANURA VINULA.—On July 31st my brother found a *Dicranura vinula* larva, which he gave to me. The day afterwards I found on it five little black things, which I thought were smuts. On August 17th I looked at it to feed it, and I found two small green larvæ and three tiny little beetles; the beetles were black, about as big as a speck of dust. When I took them off a transparent liquid flowed out.—S. C. CURTIS; Totteridge House, Totteridge, Herts, August 18, 1878.

ACRONYCTA ALNI LARVA.—Whilst out collecting at Colgrave, on August 3rd, I was lucky enough to find one larva of this rare moth feeding on hawthorn; it has since gone to pupa, and I hope to rear the imago in its season.—W. WATCHORN; Mount Street, Nottingham.

ACRONYCTA STRIGOSA IN WORCESTERSHIRE.—I took two specimens of this *Noctua* in my garden during the past summer. Both specimens were taken at sugar at about a quarter to twelve.—E. C. DOBREE FOX; Castle Morton, Worcestershire.

TAPINOSTOLA BONDII.—This species was bred in 1863 by Mr. Henry Nicholls, who found the larva feeding in the roots of a grass which grows in large tussocks along the Sandgate Road. The grass is *Arrhenatherum avenacerum*. Early in June Mr. Nicholls noticed that in these grass-tussocks some of the stems looked sickly, and by gently pulling them they broke off close down to the roots. A close search disclosed either a larva or a pupa. He collected several of each, and believing them to be *Bondii*, he sent some to the late Mr. Henry Doubleday. From those Mr. Nicholls kept he bred several *T. Bondii* and two *Miana furuncula*, which latter species feeds in much the same manner. Mr. Nicholls gave up collecting some seven years since when his collection and cabinet came into my possession, also his entomological letters, amongst which I find one from the late Mr. H. Doubleday, acknowledging the receipt of the *Bondii* larva. The bred specimens of *Bondii*, with the empty pupa cases pinned beside them, were in the cabinet when it came into my hands, so doubtless any one desiring the larva of *Bondii* may obtain it next year as indidicated, but of course it is far easier to get the perfect insect.—W. H. TUGWELL; 3, Lewisham Road, Greenwich.

LEUCANIA EXTRANEA AND L. VITELLINA AT TORQUAY.—I had the good fortune to capture at Torquay, on September 13th, at sugar, a very perfect female *Leucania extranea*, and on the following evening a female *L. vitellina*. On the 16th I found at rest on grass a second specimen of the last-named species.—A. H. JONES; Shrublands, Eltham, Kent, Oct. 1, 1878.

LEUCANIA VITELLINA AT TORQUAY.—On the evening of September 14th, in company with my friend Mr. A. H. Jones, of Eltham, I captured at Torquay a very fine male specimen of *Leucania vitellina.*—R. S. STANDEN; Holmwood Lodge, Surbiton, October 4, 1878.

SERICORIS BIFASCIANA, &c.—I met with *Sericoris bifasciana* in a garden at Mill Hill, Middlesex; it was very common on one particular fir tree; several other trees of the same species did not produce it. *Pædisca oppressana* on trunks of the aspen; *Dichelia Grotiana* beaten from hawthorn hedge, under oaks; and *Coccyx nanana* very common among *Abies excelsa* in the same garden.—R. SOUTH; 277, Camden Road, N.

ARGYROLEPIA MUSSEHLIANA AT DEAL.—Mr. Barrett has identified some Tortrices I captured at Deal last summer as the above-mentioned species. It is certainly strange that this long-lost species should have occurred in two such widely separated localities as Kent and Pembrokeshire. Your readers will recollect that the only locality given by Mr. Stainton in his Manual is Devonshire.—H. VAUGHAN; Bromley, Kent, October 21, 1878.

PTEROPHORUS RHODODACTYLUS AT MILL HILL, MIDDLESEX.—I have found the larva of this species in flowers of dogrose on several hedges in this neighbourhood; one especially good locality is the lane at the back of Buns Farm. I have also found it in the garden on moss roses.—R. SOUTH; 277, Camden Road, N.

CAPTURES NEAR LIVERPOOL—*Colias Edusa.*—In 1877 I took twenty-five *Edusa* and one var. *Helice* in one day. The members of our Entomological Society also had taken or seen many specimens of the same insect, so I think the word plentiful might be applied to their appearance in this neighbourhood in the year 1877. Bnt in the present year not a single *Edusa* has been seen by me, and all who have been afield here assure me they have seen none, nor have they heard of any being seen. *Acherontia Atropos*, another occasional visitor to this neighbourhood, has turned up, and I have throughout this month (October) obtained twenty-six pupæ and one larva, the latter on October 19th; the pupæ are all alive. They were found amongst the potatoes on two farms a few miles out of Liverpool. I was not aware of their visit until many had been destroyed by the potato-gatherers, who called them "stingin' things." The farmer being a friend of mine, I soon got within speaking distance of his diggers, well knowing what might turn up with the tubers. On showing them an old pupa they recognised it at once, stating they had smashed all they had seen, thinking they were something hurtful. I asked them to preserve them for me, and they have done so, to the advantage of farmer, diggers, and myself. *Arctia caja* was picked up, October 19th, by one of these men, and brought to me alive. Is not this a very unusual time for the imagos of this species?—T. West; St. Leonard's Terrace, Ashfield Street, Liverpool.

Lepidoptera in 1878.—The present season is the very worst I think on record. Some species, like *Nemeobius Lucina* (a common thing), have actually disappeared from localities where they were plentiful in 1877. The same tale of scarcity reaches me from America; and during a fortnight in France I did not see a hundred specimens of all kinds together. *Colias Hyale*, generally so common, was there represented by one. By the bye, I saw a *C. Hyale* at the end of July on the Cotswolds, near Wootton-under-Edge. I also took one *Lycæna Arion* on June 29th, in a stone quarry on Stinchcombe Hill, on the Cotswolds. *L. Alsus* was plentiful at the same time.—A. J. Spiller; Mangotsfield, Bristol, August 24, 1878.

Captures at Deal.—Amongst numerous species I have met with at Deal during the past summer may be mentioned *Lithosia pygmæola*, *Eubolia lineolata* (pretty varieties), *Crambus alpinellus*, *Homœosoma sinuella*, *Nyctegretes achatinella*, *Phycis adornatella* and *P. ornatella*, *Melia anella*, *Euchromia purpurana*, *Sciaphila perterana*, *Catoptria fulvana*, *Eupœcilia hybridellana* and *E. rupicolana*, *Argyrolepia subbaumanniana* and *A. Dubrisana*, *Pterophorus parvidactylus* (one very pale example reminds me of *Lætus*), *P. zophodactylus* (Loewii), *P. tephradactylus*, *P. microdactylus*, and *P. baliodactylus*.—H. Vaughan; Bromley, Kent, October 21, 1878.

Parasites of Depressaria heracliella.—On July 30th I was passing a bed of cow parsnep (*Heracleum sphondylium*), and just above the second joint of one of the largest plants I observed two holes. On cutting it down and opening it I found fifteen pupæ of *Depressaria heracliella*. I opened others and obtained fifty-eight pupæ: from them I bred fourteen moths and thirty-seven ichneumons (*Ichneumon vacillatorius*). Seven pupæ are standing over, but I believe they are infested. *I. vacillatorius* does not make a pupa-case, the metamorphosis taking place within the pupa of its victim. I also obtained two larvæ which were infested with a species of *Chalcididæ*, the two larvæ producing sixty-three imagos, these forming pupa-cases or cells within the larvæ.—G. C. BIGNELL; Stonehouse, Plymouth, October 6, 1878.

CLASSIFICATION OF INSECTS.—Having read with interest certain essays from the pen of the late Edward Newman, that have appeared from time to time on the classification of Insecta, may I be allowed to call attention to additional evidence adduceable from the evidence of the higher organs of sensation—sight and hearing? Here the presence of auditory organs and well-developed eyes place the Orthoptera first in the list; these would be followed by Homoptera (*Cicadidæ*), where the auditory organs are highly developed, but sight less potent; next to which appear to come Lepidoptera, where the *Nocturni* have well-defined auditory organs, and the *Diurni* excellent optic organs; then would follow Coleoptera, which certainly give evidence of possessing auditory apparatuses in two groups, *Lamellicornia* and *Longicornia*, although in the latter the visual organs are imperfect. As far as I can learn the species of Hymenoptera, Neuroptera, and Diptera, have the auditory sense, if present, less potent; but sight, smell, and touch are evident. This perfectly harmonizes with the circular view given in the Ent. Mo. Mag. iv. 236.—A. H. SWINTON; Binfield House, Waterden Road, Guildford, October 11, 1878.

APHIDIVOROUS CHARACTER OF THE TELEPHORIDÆ.—I have further confirmed my last season's observations on the Aphidivorous character of the *Telephoridæ*. I have many times seen, *e.g.*, *Rhagonycha melanura* sitting on the flower of a thistle, and on a hasty glance it might seem to be seeking honey like the bees and butterflies; but on closer inspection the insect's head was always found turned to the outside of the calyx, and in every case *Aphides* were there present. In this district the *Telephoridæ* have been much scarcer than usual. This season also I have not seen a single *Byrrhus* along a certain road where, during the summer of 1877, I met with them daily.—J. W. SLATER; 3, Bicester Road, Aylesbury, August 7, 1878.

STRIDULATION OF PELOBIUS HERMANNI AS EXPRESSION OF EMOTION.—I recently put a specimen of *Pelobius Hermanni* in water with a *Ranatra linearis*. The *Ranatra* seized at the beetle but missed it, when the beetle sounded its usual shrill grating note as though under the influence of fear or anger.—A. G. LAKER; Court Hill Road, Lewisham.

Drilus flavescens (female) near Ashford.—On Whit-Monday last I picked up an example of the above-mentioned rarity crossing a road on the Chalk Hills. Never having seen a female *Drilus*, but perceiving my captive was a perfect insect, though very larva-like, I forwarded it to Mr. Champion, who kindly determined the species for me. Wishing Mr. Champion to see it alive, I placed it in a jar with a banded snail or two, but it refused to feed, and after a few days laid about two dozen eggs, and died. My example is consequently a poor one. The eggs were not fertile, or I should have tried to learn something of its natural history.—T. H. Hart; Kingsworth.

Brachinus crepitans.—I have observed that the little bombardier beetle has been exceedingly plentiful this year, and I feel interested to know if this has been the experience of others. I caught my first specimen in March, and this was the first I had ever seen here; since then, and till quite lately, they have appeared in great numbers. On the South Downs, near Eastbourne, I also saw several of these insects, though I have no recollection of having observed them there before. Altogether *Brachinus* seems to have been an exception to the general scarcity of his order this year. It is a very sociable insect, and I have seldom seen one without finding others close by. These beetles are very partial to my sugar compound, and have swarmed on trees prepared for moths. *Colias Edusa* has quite disappeared from here this year.—F. G. Hopkins; Ridgeway, Enfield.

Mowing operations obstructed by Bees.—On June 27th last my man was cutting clover with a mowing machine, and hearing that he was continually stopping I proceeded to the spot to enquire into the cause. He informed me that the mower was choked by the quantity of "mouse-nests" that got on the finger-points. I picked up one of the said nests lying near, and to my surprise found it contained not young mice, but a mass of about a dozen pupa-cells of some bee. I then examined all I could find, and with the same result. The nests were beautifully formed of grass-shreddings, with apparently only one opening. From the contents of one nest I reared two perfect insects, which were somewhat larger than the honey-bee, stouter in proportion, and covered with thick gray pubescence. I have no doubt the species is well known to entomologists, but it has not come under my observation before, and consequently excited my curiosity. —T. H. Hart; Kingsworth, Ashford, Kent.

[This bee was undoubtedly *Bombus sylvarum*, a very generally distributed species.—Ed.]

Lepisma saccharina.—Will you kindly name the enclosed insect for me? It was found by myself in a chest of China tea, on August 18th.—F. B. Street.

[The insect forwarded, which was found in the chest of tea, is that well-known little household pest, the common fish-scale (*Lepisma saccharina*). These degraded little insects are especially partial to the contents of the store-room or book-case. They are of nocturnal habits, swiftly running away to some shelter when disturbed by day. Sir John Lubbock from time to time published his "Notes on the *Thysanura*" in the Linnean Society's Transactions: these subsequently developed into that important and beautiful "Monograph of the *Collembola* and *Thysanura*," issued by the Ray Society in 1873.—E. A. F.]

Celery Fly.—Will you kindly let me know the name of the insect of which the enclosed represent the larva? They have almost destroyed the whole of the leaves of my celery (six rows of ten yards each). My gardener tells me he has seen them some years ago, and that they will not injure the edible part of the plant.—W. H. Heaton.

[These small green maggots, which live in blotches between the cuticle membranes of the celery leaves, are the larvæ of a pretty Dipterous fly belonging to the genus *Trypeta* of Meigen. They blotch the leaves only, and are not injurious to the stalks unless present in extraordinary numbers, or from a very early attack on the young late plants. This year they are, however, especially abundant and destructive in and around London; I know of rows in metropolitan gardens of which the leaves are completely gone, looking as if they had been scorched or burnt up; in such cases they must be injurious to the well-being of the plants. Pinching the larvæ when in the leaf is a sovereign remedy where practicable and attended to. It is also usual to grow celery on almost the same ground year after year; where the insect is troublesome this should be avoided as much as possible.—E. A. F.]

REVIEW.

European Butterflies and Moths. Parts 1 to 7. By W. F. Kirby. Cassell, Petter & Galpin. 4to. 1878.

This work, which is illustrated by coloured plates, is based upon Berge's "Schmetterlings-Buch," and is written by our well-known correspondent Mr. W. F. Kirby, who is assistant naturalist in the Royal Dublin Society's Museum. Being published in monthly parts, at a low price, brings this useful and popularly-written book within the reach of all our readers; we strongly recommend it to the notice of those who have not yet obtained it. The plan of the work is so simple that it will be found most useful to beginners in the study of Lepidoptera, as well as to those of more extended experience, whether they desire a knowledge of the European species, or simply to follow the insular tastes too common to many of our fellow-workers in Britain. To the latter students it will teach what allied species are to be found on the Continent, even within a few miles of our shores. We fear we are correct in saying that many of our oldest British collectors would be puzzled to state off-hand how many species were represented in Europe by the genus of—say for example—*Argynnis*. This insular exclusiveness amongst British Lepidopterists is perhaps not so much the result of any bias, as of the difficulty hitherto found in obtaining a good book upon the subject, printed in English, and within the reach of reasonable means. In supplying such an important desideratum as this, Mr. Kirby has, we believe, taken the first step towards breaking through this prejudice, and it now only requires a fairly good system of interchange of specimens between British and Continental entomologists to make the study of European Lepidoptera as popular amongst our readers as has been that of their native forms. This brings us to the question of the fictitious value set upon certain well-known and even common continental species of Lepidoptera which have been rarely captured in these islands. That this should be so, in the cause of scientific knowledge, is much to be regretted, we think no one can for a moment doubt; one result of this unfortunate and totally fictitious difference in the value being that the majority of English collectors are afraid if they send a rare British form abroad, they thereby lose a chance of enriching their own cabinets and simply waste a valuable "specimen," forgetting that their collection should be ranked rather as a dictionary than a mere monument to their acquisitiveness. As an example of this want of general knowledge of the various European forms of a certain species, may be quoted the introduction and long continuance in our British list of *Dianthecia Barretti*, a species which has been relegated by British Lepidopterists even to a wrong genus. There is little doubt that other so-called exclusively British moths will eventually prove to be either melanic or other varieties of some previously known European species. We may here remind our readers that many English insects are in great request amongst Continental entomologists, and that purchase is by no means absolutely necessary, although in many cases it is the most convenient way of obtaining examples from localities which are far apart. We cannot forbear again congratulating the author upon striking this, by Englishmen, comparatively unworked vein of literature, for we are sure his work will bear fruit, if only by giving many British Lepidopterists an opportunity of pursuing a new line of thought.

Mr. Kirby has written a very useful introduction to his work, extending to considerable length. This is not an ordinary preface, but a really useful working manual of primary instruction to the would-be Lepidopterist. It is so simply written that the reader is not tired with dry scientific detail. It is further helped by a useful plate of anatomical diagrams of the various parts of a lepidopteron. This will be especially useful to the beginner, who will find not only these details, but also instructions how to collect, set, and arrange his specimens. Besides the coloured plates, showing types of genera, there will be found in the letter-press explicit descriptions of the types and varieties of species, their size, geographical description, food of larvæ, and, best of all for the English reader, well-known British insects are taken for comparison when the insect under description is not known to occur in this country.

The spirited publishers deserve support for the care taken in the production of this work. When we consider that it is issued in very large numbers, the plates are fairly good; and we should feel pleased that we live in an age when such a work can be issued to the public so cheaply.—[J. T. C.]

OBITUARY.

Thomas W. Wonfor.—This gentleman, whose name has long been familiar to all classes in Brighton, died at his residence, 38, Buckingham Place, Brighton, on Sunday, the 20th October last, in the fifty-first year of his age. Although the deceased had only been seriously ill for some three weeks before his death, his health had been failing him for years past, and he was frequently unable to leave his house for weeks together. His entry on a public career in Brighton was first made in connection with the Royal Literary and Scientific Institution at the Albion Rooms. Shortly after the formation of the Brighton and Sussex Natural History Society, in 1853, Mr. Wonfor was appointed an Honorary Secretary, a post he continued to fill to the date of his death, and the duties of which he discharged with exceptional ability and energy. At the meetings of this Society, from which he was rarely absent, his extensive knowledge and unfailing good humour rendered him a universal favourite, and his death leaves a vacancy which it will be almost impossible to supply.

The papers communicated by Mr. Wonfor to the 'Proceedings of the Brighton and Sussex Natural History Society' are very numerous, and the excellence of many of them has obtained for their author a more than local reputation.

It was as a microscopist that Mr. Wonfor chiefly distinguished himself, and one of his papers, "On certain Butterfly Scales characteristic of Sex," read at Brighton in November, 1867, was subsequently published in the 8th vol. of the Microscopical Journal, and is alluded to by Mr. Darwin in his 'Descent of Man,' &c. In addition to this may be mentioned his papers, " On the Eggs of *Articulata*," "On the Scales of Insects," &c., &c.

Besides his very numerous papers on microscopical subjects, Mr. Wonfor contributed a great number on Entomology, and nearly every other branch of Zoology, not only to the Proceedings of his own Society, but to 'Scientific Opinion,' 'Science Gossip,' and various other periodicals.

On the occasion of the visit of the British Association to Brighton in 1872, Mr. Wonfor took a very active part in their proceedings, and acted as Secretary to one of the committees.

Although the deceased never attained the position of a distinguished scientific specialist, few men ever possessed so large an amount of general information on scientific matters, or have been more ready to impart it for the benefit of others, than the amiable and accomplished gentleman, who for nearly a quarter of a century has laboured so assiduously for the intellectual improvement of his fellow townsmen.

Mr. Wonfor was appointed Curator of the Free Library and Museum in 1875; he was elected a Fellow of the Linnean Society in June, 1877, and a member of the Entomological Society of London in February last.—H. Goss.

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THE LARVA OF CHIRONOMUS PLUMOSUS (Bloodworm).

By Edward Cox.

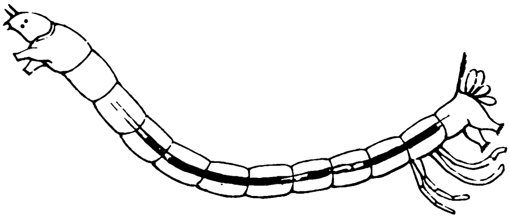

Fig. 1.—Chironomus plumosus: magnified 4 diams.

All the figures of this larva that I have seen are alike; and they are evidently taken from Réaumur's 'Memoires,' which were published about 140 years ago. When I noticed that Réaumur's figure had only 10, or perhaps 11, segments, instead of 13, I thought it might be incorrect in other respects. So I obtained some living specimens, and kept them in small glass vessels.

Having closely watched and carefully examined many of these specimens, I find that Réaumur's figure, and the copies of it in Kirby and Spence's 'Introduction,' Burmeister's 'Manual,' &c., are, as I suspected, inaccurate.

This larva has four prolegs (fig. 1); the pair on the second segment have their ends fringed with closely placed hairs, and are not unlike the prolegs of caterpillars. The other pair, which are on the last segment, have each fifteen (?) brown

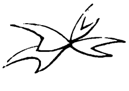

Fig. 2.—Magnified 50 diams.

claws. These claws are unequally bidentate plates with incurved teeth; they differ in size and shape (fig. 2), and are attached by one end to a central spot at the end of the leg, where they stand with their shorter convex edges next to the foot, the teeth being directed outwards; and together they form a radiate tuft which can be retracted by the muscular axis of the proleg. I know that these prolegs have been termed "air-tubes," and "respiratory organs;" even the anterior pair are called "air-tubes" by Burmeister; but, without considering their structure, the way in which they are used as organs of prehension and locomotion ought, I think, to convince any observer that they are really prolegs. Besides, this larva keeps always under water, never coming to the surface for air; consequently, air-tubes would be useless. There are four egg-shaped appendages at the extremity of the abdomen, the upper two of which are larger than the others. There are only three in Réaumur's figure, and these are equal and cylindric. Near each end of the penultimate segment are two fleshy indistinctly jointed worm-like filaments,—these are not well represented by Réaumur.

The larva has four eyes, two on each side of the head; two strong, toothed mandibles, with other oral organs, and, no doubt, a spinning apparatus; for it collects any small pieces of dirt which come in its way, and fastens them together by threads, and so makes an irregular tube, in which, holding by its prolegs, it waves its body up and down, thus producing a current which brings it food, and at the same time a fresh supply of water to its branchiæ. Sometimes it will come out, when, holding by its anal prolegs to any slight web it may have made, it will search for food, its jaws working incessantly and its head moving up and down, while it twists itself about in all directions with restless activity. Occasionally it will remain comparatively quiet, resting on its anterior prolegs, then reminding one of a pig with its feet in the trough, groping for a *bonne bouche*. It generally remains concealed, and only when disturbed, or when seeking a fresh resting-place, is it seen swimming about with that peculiar writhing motion which everybody has observed. There are a few scattered hairs about the head and thoracic segments, and two scanty tufts on a protuberance on the top of the anal segment.

The pupa of this insect also has been incorrectly represented. In the figures that are copied from Réaumur the abdomen has a segment more than it should have; the branchial tufts on the thorax are too symmetrical, and the hairs too scanty; the wing-cases are not of the right shape, and the tubes which contain the legs of the coming gnat are not shown.

These, when the pupa is ***ripe***, lie between the undeveloped wings, extend a little beyond them, and then curve backwards (fig. 3). The imago of this, and probably of some allied species also, emerges from the pupa-case with surprising celerity. This wonderful transformation is performed in less time than a man takes to change his coat. When the pupa comes to the surface of the water, the skin of the thorax parts, the head and shoulders of the gnat appear, and it comes forth steadily as though some one were squeezing it out. In fifteen seconds it is free, and flies away!

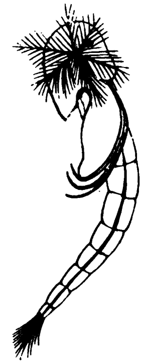

Fig. 3.—Mag. 5 diams.

172, Acre Lane, Brixton, S.W.

NOTES ON CERTAIN SILK-PRODUCING BOMBYCES.

By Alfred Wailly.

(Membre-Lauréat de la Société d'Acclimatation de France.)

As many English entomologists now take an interest in European and Exotic Lepidoptera, I send you some notes on silk-producing Bombyces which have been bred in this country during the year 1878:—

Silk-producing Bombyces with closed cocoons.

Attacus Yama-Maï (Japanese oak-silkworm).—This species, reared in Britain for several years with very little success, is in the egg state during the winter. The moths, which pair with difficulty in confinement, lay their eggs in August and September. About a fortnight after the eggs have been deposited, if fertile, they contain a larva which remains in the egg till the end of April or beginning of May (according to temperature), before it makes its appearance. In warmer countries the young larvæ hatch earlier. The eggs of *Yama-Maï* must be kept in the open air protected from the rain and the rays of the sun. In case they should hatch before the oak leaves or buds should be sufficiently advanced to feed the young larvæ, small oak trees should be potted, and protected from the frost during the winter, but the trees should never be forced in a hot-house. When the young worms have hatched they can at once be placed on the young trees, and they will seldom wander. When larger, the worms must be placed on oak branches (plunged in water), one or two feet long. Small twigs must not be used, still less cut leaves, to feed the worms. Branches should be cut in the evening; never while the sun is shining on them. If these rules be observed, failure in the rearing of the larvæ will be avoided to a great extent.

For the rearing of young larvæ I have adopted with great success the following plan:—I have large bell glasses (with four or five openings on the dome) placed on saucers full of sand covered with a piece of paper. Small branches are stuck through the paper into the sand, and no water is required to keep the foliage fresh under the glass, which, of course, must not be put in the sun. The larvæ will there thrive till they are large enough to be placed on branches plunged in water. When necessary, the glass may be raised, so as to give free ventilation; as to the droppings, they can be removed by merely blowing on the paper. If the glasses be large enough, a certain number of the larvæ may be left under them, till they form their cocoons, although it is preferable to rear them uncovered when large. When under glass, as no water is required to keep them fresh, the branches may be short, and cut according to the size of the glass, but when plunged in water they must always be long; otherwise the foliage would get watery and cause the death of the larvæ. *Yama-Maï* worms should not be placed in the open air till June. They want shade and to be freely watered in hot weather. Ova of this species should always be obtained as early as possible, so that they should pass the winter in the locality where they are to be reared. This plan for rearing the *Yama-Maï* may be adopted for all the species of silk-producing and other large Bombyces.

Attacus Pernyi (Chinese oak-silkworm).—This species, a native of North China, is very easy to rear in the open air, and will feed, like *Yama-Maï*, on all species of oak. Being double-brooded, and a second rearing being extremely difficult, if not impossible, the cocoons obtained should be kept in the open air and in a cool place, so as to prevent the moths from emerging in the autumn. In spite of precautions, when the autumn is mild, some of the moths will emerge, but the majority of the cocoons will keep till May of the following season.

The young worms of *A. Pernyi* hatch in June or beginning of July, when there is an abundance of foliage to feed them. Besides this advantage over *Yama-Maï* it has another—the great facility with which it is reproduced, the moths always pairing in whatever place they may be. The cocoon is larger than that of *Yama-Maï*.

Attacus Polyphemus (*Telea Polyphemus*) from North America.—This most valuable insect, which produces a closed cocoon like the two preceding species, is polyphagous, thriving well on willow, birch, oak, nut, chestnut, beech, elm, &c. This species must be considered as single-brooded. It is so in Illinois and Michigan, at least when the larvæ are reared in the open air.

Several of my correspondents who, this year, bred *A. Polyphemus*, having obtained the moths in the autumn, it must be stated that the cocoons were kept in rooms, which should not be done if they are to be preserved till May of the following year, when the moths begin to make their appearance. It must also be borne in mind that many species of Lepidoptera which are single-brooded in northern countries may become double-brooded if bred in captivity or in warmer countries.

A. Polyphemus can be reared in the open air in this country. At the end of last July, previous to a journey I made to Paris, I left a few *Polyphemus* larvæ on small trees in my garden, nut, willow, and birch. On my return to London in September, I was much pleased to see fine cocoons on the trees, although the quality of the foliage was not good.

The larva of *A. Polyphemus* is most magnificent. In its last stage it is covered with forty-eight silver and eight gold metallic spots, the latter being on the first two segments. When the sun shines on the larva, which is of a fine green with small pink spines, it seems covered with diamonds.

The fine and strong silk of *Attacus Yama-Maï*, *A. Pernyi*, and *A. Polyphemus* could be seen at the Paris Exhibition. The silk of *Yama-Maï* is light green, *Pernyi* light brown, and *Polyphemus* white. Besides the three species mentioned, there are several others which produce closed cocoons, but as they have not, as yet, been bred in this country, no mention will be made of them.

(To be continued.)

RAMBLES AFTER RARITIES: LONDON AND LYNDHURST, 1875.

By Bernard Lockyer.

Perhaps, even should the greater lights on Entomology fail to find interest in the accompanying stray leaves from the diary of my last season's collecting, some of the lesser ones may not disdain to peruse them for the sake of such hints, as I can afford them, from the result of four years' experience in the New Forest.

At the beginning of the season I had but little in hand, save a few larvæ of *Mania maura* and *Noctua rhomboidea*, which for the sake of making their acquaintance, preparatory, as I hoped, to taking them in their native haunts, I had kept feeding on a pabulum, much esteemed by hybernating *Noctuæ*—viz. carrots—through the winter. *Tæniocampa miniosa* put in an appearance in my breeding cages in March, from larvæ collected at Lyndhurst the previous season.

On March 25th I packed up my collecting traps and went to Lyndhurst. Luckily the weather proved fine, but things were hardly forward enough for very successful operations in the entomological way. A delightful spring walk through the locality for *Leucophasia sinapis*—an enclosed plantation of young firs and oak, intersected, as is the case with all the newer enclosures, by very broad flowery rides (the haunt of *Hyria Auroraria*, *Acosmetia caliginosa*, &c.), and known to those initiated in the Government Survey maps as Park Hill Enclosure—only produced a few dozen of the pretty young larvæ of *Thera variata*, and a few of the, at that time, anything but attractive ones of *Ellopia fasciaria*. I think few would imagine that the really gaily-coloured full-fed larva of this insect had started in life so pachydermatous and ugly in general appearance.

Full of expectations of plenty of work amongst the spring-feeding *Noctuæ* larvæ I wended my way in the evening to the shades of the Hurst Hill Enclosure,—a wood to the west of the Brockenhurst Road, composed of oaks and horse-chestnuts about seventy years old, with an undergrowth of wild rose, sloe, hawthorn, and bramble, with here and there a clump of birch; the ground in summer carpeted by *Polypodium* and various weeds, and intersected by a most annoying number of wide ditches overgrown with similar plants. The wood is well situated for collecting, being between two heathy tracts of undulating country, till lately well supplied with birch copses, and surrounded by some of the finest old oak and beech woods in the forest,—such as Whitley (oak) Wood, between it and the Brockenhurst Road, and Gritnam (beech) Wood, between it and the Christchurch Road to the north-west (a locality for *Sarrothripa Revayana*). There is, moreover, an enclosure to the east opening out of it abounding in old fir trees (New. Park Enclosure), and a farmyard at one corner. It was here in August, 1874, that I took varieties of *Cidaria immanata* at sugar, quite equal to those from Scotland; besides dozens of *Noctua rhomboidea*, and specimens of *Triphæna interjecta*, *Agrotis puta*, *Cerigo cytherea*, &c. Having sugared I took to larvæ hunting, expecting at least a few good things; but though I could hear the young creatures falling off their food-plants as I shone the light on them, I could not secure anything better than a minute individual, which I made out to be *Noctua brunnea*. This sort of thing, carried on till 10 p.m., grew rather back- if not heart-breaking; so after a round at sugar, which produced a few nice *Tæniocampa munda* and some common hybernated *Noctuæ*, I retired.

Next morning I made up my mind to a long stroll, and full of determination started for the confines of the forest. I passed through what seemed to promise to be glorious collecting ground, lying to the east of the Christchurch Road; and a most muddy ramble I had. I tried a little oak-beating about Rhinefield Sandys, where in 1874 one had but to tap the twigs to fill one's umbrella with such larvæ as *Diphthera Orion*, *Boarmia roboraria*, *B. consortaria*, *Eurymene dolabraria*, *Notodonta dodonæa*, *Tephrosia extersaria*, &c.; but none of the expected *Roboraria* gladdened my eyes. This is the last and largest enclosure between Hurst Hill and the main road; and at Welverley, an extensive wood seven miles from Lyndhurst, I added to my store of *Thera variata* to the extent of three only. After crossing the rails near Holmsley with some difficulty, owing to the slipperiness of the ground, and tramping laboriously through two miles of woodland path by Wootton Copse Enclosure, I reached home *viâ* Set Thorns and Aldridge Hill, not too late to take another turn at sugar, whereat my only notable capture was one *Tæniocampa munda*.

Next day, after hard work in Park Hill Enclosure, I came back the richer by one *Ellopia fasciaria* and a few *Thera* *variata*, and a solitary young *Boarmia roboraria* knocked off a young oak. Variety is charming, so I bethought me that I would change my field of operations, and in the evening I struck out for Pondhead Enclosure, on the other side of the Brockenhurst Road, and one of the favoured haunts of the graceful *Limenitis sibylla*. But I had little better luck here: the evening was chill, and my captures at sugar were one *Tæniocampa instabilis* and two *T. munda*. As to larvæ they eluded my search by the same gymnastic feat as before; and on reaching home I found my captures were confined to *Triphæna fimbria* and *Noctua triangulum*. Slightly disappointed the next day found me back in London.

April I devoted to hard night-work at Highgate and Hampstead, being anxious to verify my suspicions concerning some larvæ I took there first in 1872, and which I set down as *Triphæna janthina* and *Noctua baja*. I found larvæ commoner than usual. Between April 1st and June 16th I spent sixteen nights at this work: the result of my operations was about four hundred and fifty larvæ. In the spring (at Highgate especially) *Noctua brunnea* predominated; seventy-eight fell to my share. Next followed *Boarmia repandata*, which is most conspicuous from its pale colour, sticking out with arched back from the bramble twigs; but of this I only took thirty-two. Of *Noctua triangulum*, *N. festiva*, and *Aplecta nebulosa*, I took about two dozen each. Then followed *Triphæna orbona*, *T. janthina*, *Noctua augur* and *N. baja*, which were severally represented by about a dozen specimens. *Triphæna fimbria* was very rare near London; but at Lyndhurst in May it turned out *en masse* to greet me, and I could have taken hundreds, but contented myself with fifty-three. I also picked up stray larvæ of *Odonestis potatoria*, *Leucania lithargyria*, *Miana strigilis*, and *Urapteryx sambucaria*. As I have already noted I captured in June about a gross of *Xylophasia scolopacina*, along with which I took the pretty larvæ of *Larentia didymata* (on grass, well under large clumps of undergrowth), *Tæniocampa gothica*, *T. cruda*, and *Cosmia trapezina*.

I may as well add here that I found that the usual colour of larvæ of *Noctua brunnea* may be better described as dull rosy red, not reddish brown. Pale and ochreous varieties run very near to *Noctua baja*, but may be separated by the position of the pale spot on the subdorsal line, which in

Noctua brunnea is in the centre of the segment, and in *N. baja* near the hinder end of it, and by the markings on the heads. *Noctua festiva* I find I described as ferruginous, in error. All those I took at large between 1872 and 1875 were either a peculiar tint of olivaceous ochreous, more or less clouded over with a dull pinkish, and with the hinder part of each segment appearing as an ill-defined, transverse, delicate rosy band, or else dirty ochreous or grayish ochreous; often with all the triangular marks pale raw-sienna brown. *Triphæna janthina* and *Noctua augur* are especially attached to hawthorn and sloe: the former (at Highgate, at any rate) has a lateral stripe of a delicate rosy tint, and is altogether a very translucent looking creature. I think it is rather odd that though the larva of *Noctua triangulum* occurs every season at Highgate I never took the imago at sugar or on the wing.

19, Burghley Road, Highgate Road, August, 1878.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

NOTE ON THE RARITY OF COLIAS EDUSA IN 1878.—During the present year I have seen but two specimens of *Colias Edusa*—one in June in the New Forest, and the other I took on October 15th near Lewes, apparently but just emerged from the chrysalis. Mr. J. H. A. Jenner, of Lewes, saw but one during the year; this was seen near the spot where I captured mine, but ten days later, viz. on October 25th.—J. JENNER WEIR; 6, Haddo Villas, Blackheath, S.E.

ABSENCE OF COLIAS EDUSA IN 1878.—I have not seen a single specimen of this species this year, though last year the insect absolutely swarmed in the neighbourhood of Guildford and for miles round; the variety *Helice* also occurred, and I myself took one. Although *Colias Edusa* was so abundant that year, I did not see any specimens of *Colias Hyale*.—G. W. OLDFIELD; Weybank House, Guildford, November 4, 1878.

NOTES FROM HARWICH, 1878.—*Colias Edusa*.—The only specimen seen and captured here was a freshly emerged male on the 18th of August. Last year it was the most common butterfly here. *Acherontia Atropos*.—A fine specimen was caught on the 18th May. This autumn there has been a large number of larvæ and pupæ taken. *Liparis salicis*.—On the morning of the 27th June last thousands of these moths appeared, having come over the sea. I was informed that they arrived at the break of day, and resembled a fall of snow—they were so numerous. They were also observed many miles at sea. On the day of their arrival they might be seen by hundreds at rest on the buildings facing the sea. I secured many fine specimens.—F. KERRY, Harwich.

CHŒROCAMPA CELERIO AT BRIGHTON.—I procured on October 4th the larva of the silver-striped hawk-moth (*Chœrocampa celerio*); it was found in a garden at Brighton. It appears nearly full fed, and no doubt will turn in a few days. Being a very rare species, more especially in the larval state, I have much pleasure in recording its capture.—C. BRAZENOR; 39, Lewes Road, Brighton, October 5, 1878.

DEILEPHILA LIVORNICA IN GLAMORGANSHIRE.—A specimen of *Deilephila livornica* was captured at Merthyr-mawr, Bridgend, during the third week in August. It was in good condition, and was found on the dining-room window attracted by the light.—G. F. HAMPSON; Exeter College, Oxford.

NOTES ON BOMBYX QUERCUS.—I have often been at a loss to account for the great mortality amongst the larvæ of this species. From a partiality to the larvæ and imagos, I have generally collected as many as came in my way when out, but I never yet succeeded in bringing more than a small percentage of them to the perfect state. Whether this has been from lack of any special treatment I am anxious to learn, and probably these notes may call forth a few from others who have had similar experience with this species. During the present year I collected seven larvæ of *B. quercus* in different stages of growth, which fed well, and to all appearances maintained perfect health; they constructed cocoons, and I awaited their emergence, but not one moth came out. A few evenings ago I cut the cocoons open; four of them contained dried-up larvæ; the other three had partially undergone metamorphosis; none of them had been ichneumoned. Again, on referring to my entomological diary, I find on May 15th, 1870, I collected eight larvæ; these all fed well and duly spun cocoons, but no imagos emerged. In 1871 I took four larvæ, but obtained no imagos; in 1873 twelve larvæ spun, but I got no imagos from them; in 1876 they were unusually abundant and early, when between April 2nd and May 14th I obtained forty-five larvæ, the majority of which spun cocoons, the first on May 24th, and the last on July 9th; the first pair of imagos emerged on July 4th, another pair on the

8th, a female on the 10th, and another on the 12th, which, on being treated with oxalic acid, readily deposited a quantity of eggs, which to my surprise produced larvæ a few days afterwards. I had no males at the time in or near the cage. I am aware that this is not unusual with some species of *Lepidoptera*, but this is the first time it has come under my own notice. A similar case of parthenogenesis relative to this species is noticed by Mr. C. O. Groom Napier in the volume of 'Science Gossip' for 1868, p. 71. He says, in writing of this species, "One year I had many virgin females, some of which laid fertile eggs." I should be glad of any information which might lead to more successful rearing. I may remark that all my larvæ were fed indoors separate from other species, always being in reach of a plentiful supply of fresh hawthorn. It would be interesting to know whether this mortality is peculiar to this species in a state of nature.—R. LADDIMAN; Norwich.

SUGAR *versus* HONEY-DEW.—I have often heard friends complain of their sugaring expeditions being unsuccessful, and attribute failure to the counter-influence of honey-dew; but I cannot quite bring myself to believe that this is the true cause of non-success. During the seasons of 1875 and 1876 I had good opportunities of observing the result of honey-dew attraction as against that of sugar. The scene of my operations was a garden and orchard bordered by large oaks, elms, and aspens: on the trunks of these and a few fruit trees I spread my bait. Four plum trees of low bushy growth stood in about the centre of the garden: these were covered with a fine crop of *Aphides*, instead of plums; the leaves twisted and curled, presenting altogether a very dejected appearance in the day-time. The following table will show the relative merits of the artificial and natural attractions:—

JULY 9 TO AUG. 28, 1875.

	Sugar.	Honey-dew.
Cosmia diffinis	76	11
Noctua rubi	68	5
Cosmia pyralina	60	7
Caradrina blanda	54	43
Cosmia affinis	42	16
Mania maura	34	3
Cerigo Cytherea	32	0
Caradrina Alsines	14	6
Tethea subtusa	0	4
,, retusa	0	1

JULY 14 TO AUG. 15, 1876.

	Sugar.	Honey-dew.
Caradrina blanda	40	27
Cosmia diffinis	37	6
Cerigo Cytherea	24	0
Cosmia pyralina	17	9
Caradrina Alsines	13	3
Cosmia affinis	8	2
Tethea subtusa	2	14
,, retusa	0	4
Tryphæna interjecta	0	2

A large number of commoner species visited the sugar, but very few the honey-dew; two or three *Geometræ* showed preference for the latter; and *Herminia tarsipennalis*, *Pyralis fimbrialis* and *P. glaucinalis* were common on the former. On the whole the balance of species and individuals was decidedly in favour of sugar. On several nights visitors to my feast were scarce; but at that prepared for them by the *Aphides* they were even more so. On these occasions the invited must have had important engagements, which prevented their attendance at the rival banquets; and so passed on their invitations to certain earwigs and slugs, for these gentry were present in large numbers. I am inclined to think the condition of the atmosphere is the chief point upon which depends the result of our sugaring; but what that condition should be I am unable to say. In the month of August, 1876, I sugared almost every night; and I took a few notes as to the state of atmosphere, wind, direction and force, thermometer readings, moonlight, &c., but have been unable to go into the matter since. Next year I hope to do so, and shall be glad of any suggestions on the subject.—R. SOUTH; 277, Camden Road, N.

IS PERICALLIA SYRINGARIA DOUBLE-BROODED?—Upon referring to Newman's 'British Moths,' and some other entomological works, I find the above question answered in the negative, which is quite in accordance with my experience previous to this season. However, from the facts stated below, I now hesitate in giving that opinion. This year I took the first moth of the species mentioned upon July 4th, and saw the last on the 13th of the same month: from females taken I obtained four broods of larvæ, some of which were hatched on July 19th. A little later in the month I observed that something had commenced to feed upon a lilac; but unfortunately I omitted to search for the intruders until August 16th, when a larva nearly full fed was taken; the imago appearing on August 30th. Later on another search was made, which resulted in finding a pupa; the perfect insect in this instance emerged September 5th. I may add that these two moths are of a different shade to any others I have taken, a point which is quite in harmony with the second brood of other species in this group. Thus I am led to suppose that these caterpillars were hatched at the same time as mine, and consequently have produced a second brood. Can any of the readers of the 'Entomologist' kindly inform me if in breeding *Pericallia syringaria* they have ever obtained a second brood?—H. T. Dobson, jun.; New Malden, Surrey.

[Kaltenbach ('Pflanzenfeinde,' p. 437) gives this species as double-brooded, but that it is not normally so in Britain the following instances will show, although it occasionally occurs twice in the year. The most striking case is that of Colonel Stewart's, who, in 1864, had about twenty-five larvæ, which were all hatched within twenty-four hours; one only of these progressed rapidly, and emerged at the end of September, the rest hybernating as larvæ (Entom. ii. 102). Mr. Elisha also records an instance of part of a brood feeding up rapidly, the imagos appearing in August, whilst the remainder hybernated as larvæ (Entom. v. 170). This abnormal autumnal appearance of the imagos is again corroborated (Entom. vi. 13) by the Rev. Bernard Smith.—E. A. F.]

Cleora viduaria.—*Cleora viduaria* seems to have unaccountably disappeared from the New Forest, formerly its chief locality. Six years ago, about the end of July or beginning of August, Mr. George Gulliver, of Brockenhurst, saw a number of females in a worn condition sitting on the tree trunks. A few days afterwards he could find none, and has not seen a specimen from that time to this. I have seen none myself when I have been in the Forest; and as far as I can learn the disappearance is complete. The disappearance of *Orgyia cœnosa* from Wicken Fen is explained in the September number of the 'Entomologist' (Entom. xi. 212), by the fact that the fen was flooded in 1875 and 1876; the moth, moreover, is again appearing in its old locality. There seems, however, no reason to be given for the disappearance of *C. viduaria;* and the unusual gathering of females above mentioned makes the fact still more strange. *C. glabraria* is to be found in the plantations around Brockenhurst in fair numbers at the beginning of August.—[Rev.] W. W. Fowler; Repton, Burton-on-Trent.

Apostega spatulella in Essex.—While looking over some insects, captured by me during this summer in South-east Essex, Mr. Sidney Webb kindly pointed out a specimen of *Opostega spatulella.* This species has hitherto, I believe, only been recorded from Devonshire and from North Essex.—John T. Carrington; Royal Aquarium, Westminster, S.W., November, 1878.

Diasemia ramburialis and Pionea margaritalis at Folkestone.—I had the good fortune to take one specimen each of the above species near Folkestone, the former in the beginning of October and the latter in July.—W. Purdey; 132, Dover Road, Folkestone.

British Hymenoptera. — Among other less common *Hymenoptera*, I have taken here this year, *Myrmicisa Latreillii*, female and male, and one male of *Stenamma Westwoodii*.—E. Capron, M.D., Shere, near Guildford, October 15, 1878.

Libellulidæ in London.—During the first week in last September I observed on more than one occasion several dragon-flies sporting in the sunshine about mid-day, in Oxford Street.—R. T. Gibbons; Ceciltyne House, Cavendish Road, Brondesbury, N.W.

Parasite of Sphinx ligustri.—I have this summer bred three fine specimens of *Trogus lutorius* from three pupæ of *Sphinx ligustri*. The metamorphosis took place within the doomed pupa. On examining the pupæ after the parasites had emerged I found each of them about half-filled with thick creamy-looking matter, but no indication of a parasitic pupa-case.—G. C. Bignell; Stonehouse, Plymouth, November 6, 1878.

Further Notes on Acrida viridissima.—Whilst staying by the sea last August, at Pendower Castle, on the east coast of Cornwall, I had ample opportunity of watching the habits of this species of Orthoptera, which abounded everywhere in the neighbourhood. I could not, however, discover satisfactorily what they do in the daytime, but I think the males spend it in a semi-dormant condition, whilst the females are engaged in procuring food. Such, at least, was the case with a pair I kept alive for some time. As the night closes in, the males crawl up the stalks of thistles, &c., taking their position generally with their heads downwards, preparatory to their nocturnal concert. Then the music begins, and all the hedges and fields for a mile round seem really to "burst" with the noise, causing the trees to almost tremble with the echo cast upon them from the surrounding hills. After sugaring, the sound used to be ringing in my ears for hours. This peculiar noise is produced by rubbing together two hard spots at the base of the elytra, and is intensely shrill and piercing. They are very bold whilst thus engaged, allowing one to get hold of the bush in which they are situated, dodging round the stalk if threatened by the hand. I have no knowledge of the female making any sound at all. When caught these insects are very ferocious, and will bite one's hand with vigour. So angry, indeed, was one almost to take the place of those of *N. lenticularis*; and in the other localities I have named, the common oak-spangle gall has also been unusually absent. The fact of the oak leaves not being, as in some recent seasons, so overloaded with the common spangles as to leave little chance of growth to the more delicate species, is enough to account for a larger number of those, both of *N. læviusculus* and *N. fumipennis*, being observable this year; but in itself the small number of *N. lenticularis* which has been observable this autumn in some of its favourite haunts, whilst at the same time it has been remarkably plentiful in others, is of some degree of interest.—E. A. ORMEROD; Dunster Lodge, near Isleworth, November 12, 1878.

HAGGERSTON ENTOMOLOGICAL SOCIETY, ANNUAL EXHIBITION.—The annual exhibition of insects took place on the 21st and 22nd of November, as usual, in the rooms of the Society, Brownlow Street. Although not so large as some of the former Exhibitions there were many interesting insects there. Amongst them was a series of the Lepidopteron recently added to the British list, *Tinea Orientalis* (Stainton), bred from horns by Mr. Simmons, who had also in the same case many beautiful *Cucullia gnaphalii*. Mr. Meek showed eight cases of Lepidoptera from Rannoch, the North and South-west of Ireland, Howth, and the fens of Norfolk and Cambridge, all in beautiful condition. Mr. Weston, a case of Lepidoptera, including *Hydrilla palustris*, *Leucania extranea*, and a curious *Lycæna Adonis*. Mr. Eedle had several educational cases of a highly interesting character, showing the metamorphoses of insects; also a box of fine varieties of well-known Lepidoptera. Mr. Sidney Webb showed a remarkable box of white and silvery forms of British butterflies and moths. Amongst other varieties were a beautifully-marked pale form of *Abraxas grossulariata*, taken by Mr. Priest in Kent (this specimen was the admired above all others in the Exhibition); two *Vanessa cardui*, exhibited by Mr. J. A. Clark; a pair of odd-sided *Smerinthus tiliæ*, by Mr. Pratt; and a curious series of *Abraxas grossulariata* from a second brood, reared by Mr. H. Bartlett. Lepidoptera, as usual, was by far the best represented order; but other orders were exhibited by Messrs. Eedle, Hillman, and Vanderburgh. A large number of visitors were present on each evening.—ED.

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